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1. II.--The Marine Fishes and Invertebrates of Loch Fyne.
15th Ann. Rpt. Fish. Bd. Scotland, Pt. 3, Vol. 2.
pp. 107-174, pls. I-III. 1897
2. XI.--Notes on the Animal Plankton from H. M. S. "Research"
15th Ann. Rpt. Fish. Bd. Scotland, Pt. 3, pp. 305-315.
1897
3. V.--On the Distribution of Pelagic Invertebrate Fauna of
the Firth of Forth and Its Vicinity during the Seven
Years from 1889 to 1895, both inclusive.
16th Ann. Rpt. Fish. Bd. Scotland, Pt. 3, 1898, pp. 153-
209, pls. IV-VII. 1898
4. VII.--Notes on Recent Gatherings of Micro-Crustacea from
the Clyde and the Moray Firth.
17th Ann. Rpt. Fish. Bd. for Scotland, Pt. 3, pp. 248-
273, pls. X-XIII. 1899
5. VI.--The Fishes of the Firth of Clyde.
18th Ann. Rpt. Fish. Bd. Scotland, Pt. 3, pp. 272-293.
6. XI.--Notes on some Gatherings of Crustacea Collected for
the most part on board the Fishery Steamer "Garland" and
examined during the year 1899.
18th Ann. Rpt. Fish. Bd. Scotland, Pt. 3, pp. 382-407,
pls. XIII-XIV. 1900
7. Notes on Gatherings of Crustacea, Collected for the most
part by the Fishery Steamer "Garland" and the Steam
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19th Ann. Rpt. Fish. Bd. Scotland, Pt. 3, pp. 235-281,
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8. VIII.--Notes on Gatherings of Crustacea Collected by the
Fishery Steamer "Garland" and the Steam Trawlers "Star of
Hope" and "Star of Peace" of Aberdeen, during the year
1901.
20th Ann. Rpt. Fish. Bd. Scotland, Pt. 3, pp. 447-485,
pls. XXII-XXV. 1902b
9. II.--On some new and rare Crustacea collected at various
times in connection with the Investigations of the
Fishery Board for Scotland.
21st Ann. Rpt. Fish. Bd. Scotland, Pt. 3, 1903,
pp. 109-135, pls. II-VI.
10. VI.--Some Further Observations on the Food of Fishes, With
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21st Ann. Rpt. Fish. Bd. Scotland, Pt. 3, 1903, pp. 218-
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FISHERY BOARD.

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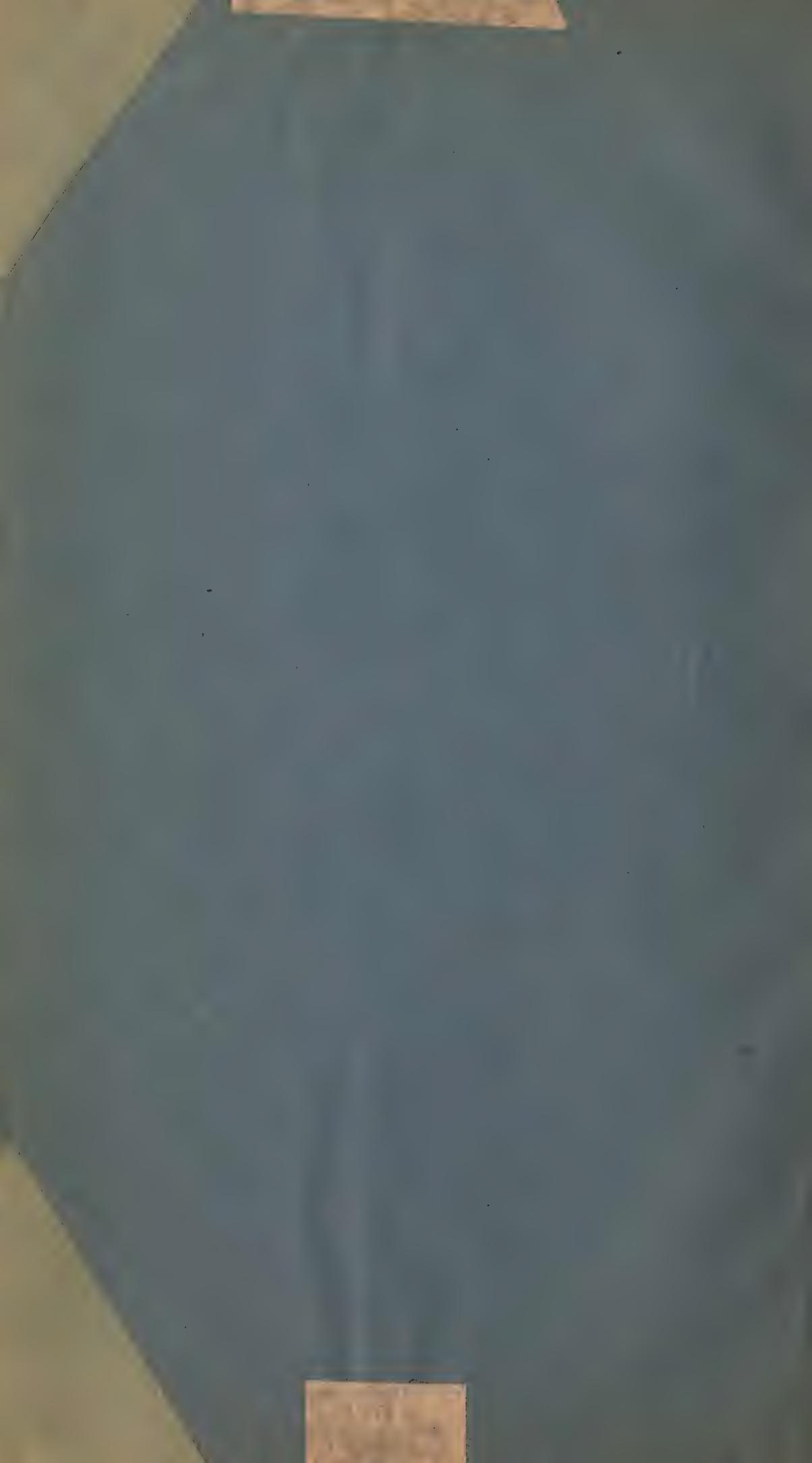
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CRUSTACEA, ETC.

VOL. I.

T. SCOTT.

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II.—THE MARINE FISHES AND INVERTEBRATES OF LOCHI
FYNE. By THOMAS SCOTT, F.R.S. Mem. Soc. Zool. de France.
(Plates I.-III.) *Published July 3rd 1897*

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INTRODUCTORY.

In the following catalogue an endeavour has been made to include, as far as possible, the various species of marine fishes and invertebrates that are known to have been obtained in Loch Fyne. But though the records brought together here—the most of which are believed to be authentic,—comprise a large number of fishes, and include representatives of almost every group of the marine invertebrates, the catalogue can only be considered as preliminary to further research. The investigation of the lower forms of life existing in Loch Fyne has already been in some respects very successful, and has yielded interesting results; still, there are several groups of the Invertebrata, such as the Tunicata, the Polyzoa, the smaller Crustacea, the Aannelida, the Cœlenterata, and the Porifera, that have only been very partially studied, and it may reasonably be expected that numbers of species belonging to these various groups will yet be discovered in Loch Fyne.

In this catalogue the total number of species enrolled is 837, which includes several not before recorded from the Clyde, and also one Copepod new to Britain, and one new to science.

An appendix at the end of the catalogue of the Loch Fyne fauna contains records and descriptions of several new and rare species that have been observed during the past year in the seaward part of the Clyde area, and which, therefore, could not find a place in the catalogue.

These records include three apparently undescribed species of *Copepoda*, two Amphipods, and a parasitic Isopod, new to Britain; and a few others that are either new records for the Clyde, or that refer to species that are comparatively rare.

As *Calanus finmarchicus* is a very important constituent of the food of fishes, attention is also directed in the appendix to three different kinds of parasites that have been found more or less infesting the *Calanii* in the Firth of Clyde.

The following is a tabular view of the principal groups represented in the catalogue, their principal sub-divisions, and the number of species belonging to each :—

Names of the Principal Groups represented in the Catalogue.	Names of the Principal Sub-divisions.	Number of Species belonging to each of the Principal Sub-divisions	Number of Species belonging to each of the Principal Groups.	Remarks.
Fishes	{ Teleostei Ganoidei Elasmobranchii	56 1 5	62	
Tunicata	{ Larvacea Ascidiacea Cephalopoda Pteropoda Opisthobranchiata Nudibranchiata	1 8 5 1 20 18	9	
Mollusca	{ Pulmonata Prosobranchiata Polyplacophora Scaphopoda Pelecypoda	2 84* 5 2 84	221	* One is doubtful.
Branchiopoda	{ Brachyura Macrura Schizopoda Cumacea Isopoda	27 18 18 15 18	2	
Crustacea	{ Amphipoda Phyllocarida Cladocera Ostracoda Copepoda Cirripedia	76† 1 3‡ 67 99§ 7	349	† Two are doubtful. ‡ One is doubtful.
Polyzoa	{ Cheilostomata Cyclostomata Ctenostomata Chaetopoda	15 5 2 47	22	§ Includes a new genus and two new species.
Vermes	{ Gephyrea Chaetognatha Nemertea Turbellaria Crinoidea	2 1 1 1 1	52	One is doubtful.
Echinodermata	{ Asteroidea Ophiuroidea Echinoidea Holothurioidea	9¶ 11** 5 6	32	¶ One is doubtful. ** Two are doubtful.
Actinozoa	{ Alcyonaria Actiniaria	3 9	12	
Hydrozoa	Hydriida	14	14	
Spongozoa	Miliolidæ Astrorhizidæ Lituolidæ Textulariidæ Lageniidæ Globigerinidæ Rotuliidæ Nummulinidæ	14 1 5 3 18 1 8 5	7	
Foraminifera			55	
Total number of Species				837

I desire to explain, though it may hardly be necessary to do so, that

the information contained in this catalogue is partly at least a compilation from the recorded results of past investigations, and has only to a limited extent been obtained as the result of independent study. The following are the principal sources from whence the information contained in the catalogue has been derived :—

- (1) An extensive and valuable series of MS. records from the steam yacht 'Medusa,' which Dr John Murray has kindly placed at my disposal.*
- (2) *The Decapod and Schizopod Crustacea of the Clyde*, by Dr (now Professor) J. R. Henderson,
- (3) *A Contribution towards a Catalogue of the Amphipoda and Isopoda of the Clyde* (in two parts), by the late Dr Robertson of Millport.
- (4) 'A List of the Marine Fauna collected at the Tarbert (Loch Fyne) Laboratory during 1885,' by George Brook and Thomas Scott (published as an Appendix in the *Fourth Annual Report of the Fishery Board for Scotland*).
- (5) *The Mollusca of the Firth of Clyde*, by Alfred Brown.
- (6) 'Notes on the Copepods of Loch Fyne,' by W. L. Calderwood (published as an Appendix in the *Fourth Annual Report of the Fishery Board for Scotland*).
- (7) The scientific researches in Loch Fyne during the past year of the Fishery steamer 'Garland.' These researches have yielded a considerable number of new records.

The following abbreviations are used in the catalogue :—

(M.) Refers to the MS. Records of the steam yacht 'Medusa,' as the source of information.
 (H.) Dr Henderson's *Higher Crustacea of the Clyde*.
 (R.) Dr Robertson's *Amphipoda and Isopoda of the Clyde*.
 (B. & S.) The List of Tarbert Fauna for 1885.
 (G.) Records obtained by means of the Investigations of the 'Garland.'

Other sources of information are, wherever necessary, duly acknowledged.

I have to acknowledge my indebtedness to Captain Campbell of the 'Garland' for his unwearied interest in the work, and for his efforts to render it successful. I have also, as in former years, been greatly indebted to the Rev. T. R. R. Stebbing, F.R.S., for the kindly manner in which he has from time to time endeavoured to assist me with the identification of Crustacean species. Professor G. S. Brady, F.R.S., has also kindly assisted me on various occasions. My son, Mr Andrew Scott, has prepared the series of interesting drawings which illustrate this paper.

FISHES OF LOCH FYNE.

Note.—In this catalogue the names and arrangement in Dr Day's work on the British Fishes are followed.

TELEOSTEI.

Cottus scorpius, Bloch.—Common in Loch Fyne and generally distributed ; the large and richly coloured variety, *Grøenlandicus*, is also more

* A very large number of the specimens referred to in these lists were collected by Captain Alexander Turbyne and Mr Fred. G. Pearcey in Dr Murray's steam yacht 'Medusa,' and the species were determined by Dr A. Günther, F.R.S. (Fishes) ; Professor F. Jeffrey Bell, F.R.S. (Echinodermata) ; Professor A. C. Haddon, F.R.S. (Actiniaria) ; Professor Arthur Dendy, F.L.S. (Sponges) ; E. A. Smith, Esq., F.L.S. (Mollusca and Tunicata) ; Miss F. Buchanan (Worms) ; R. I. Pocock, Esq. (Crustacea) ; and R. Kirkpatrick, Esq. (Hydrozoa and Polyzoa).

or less frequent (B. & S.).—Upper Loch Fyne at Minard, and on east side in 10 to 20 fathoms (M.).

Cottus bubalis, Euph.—Moderately common in Loch Fyne (B. & S.).

Trigla Gurnardus, Linné.—Upper Loch Fyne (M.). In trawl-net near the head of the loch, and in the vicinity of Furnace and Minard (G.).

Trigla lineata, Gmelin.—East Loch Tarbert, Loch Fyne, not common (B. & S.).

Agonus cataphractus, Linné.—East Loch Tarbert, occasionally (B. & S.). Off Castle Lachlan, rare (G.). Ardrishaig (Dr Scouler).

Scomber scomber, Linné.—Abundant during the summer, particularly along the west shore of Loch Fyne (B. & S.).

Zeus faber, Linné.—Usually enters East Loch Tarbert in September to feed on herring offal (B. & S.).

Gobius Ruthensparri, Euph.—Common amongst *Zostera* in East Loch Tarbert (B. & S.). Upper Loch Fyne (M.). Off Ardno, Upper Loch Fyne (G.). Loch Fyne (Dr Scouler).

Gobius minutus, Gmelin.—Frequent in East Loch Tarbert (B. & S.). Upper Loch Fyne at Minard, west and east sides, and centre in 10 to 70 fathoms (M.). Loch Gair, off Ardno, Kinglass Spit, and near the head of the loch (G.).

Gobius niger, Linné. Upper Loch Fyne (M.). Taken by the fishery steamer 'Garland' in various parts of, and at various depths in, Upper Loch Fyne.

Gobius, sp.—West side of Upper Loch Fyne in 10 to 15 fathoms (M.).

Calionymus lyra, Linné.—East Loch Tarbert, frequent but small (B. & S.). Upper Loch Fyne, east side, in 15 fathoms (M.). Loch Gair, Tarbert Bank, and other places (G.).

Cyclopterus lumpus, Linné.—Adult specimens are not common, but the young are moderately frequent (B. & S.). Upper Loch Fyne, in the centre near the head (M.). Otter Spit, one 45 mm. in length (G.).

Liparis vulgaris, Linné.—Taken between tide marks in East Loch Tarbert (B. & S.). Upper Loch Fyne, on the shore (M.).

Liparis Montagui, Donovan.—Taken in East Loch Tarbert between tide marks (B. & S.) (?). Upper Loch Fyne, west side and shore (M.).

Carelophus Ascanii, Walh.—One specimen taken amongst boulders at low water in East Loch Tarbert (B. & S.).

Lumpenus lampretaeformis (Walbaum).—Four specimens taken with shrimp-trawl between Dunderave and Carndow (G., April 1896).

Centronotus gunnellus, Linné.—Plentiful between tide-marks East Loch Tarbert (B. & S.). Upper Loch Fyne on the shore (M.). In Inveraray Bay (G.).

Atherina presbyter (Jenyns).—Frequent amongst *Zostera* in East Loch Tarbert in the spring of 1885, but not met with later (B. & S.).

Gasterosteus spinachia, Linné.—Frequent in the in-shore water amongst sea-weed and *zostera*; East Loch Tarbert and other places (B. & S.). Upper Loch Fyne, not uncommon among the contents of the shrimp-trawl (G.).

Labrus maculatus, Blainville.—Frequent in Loch Fyne in the autumn (B. & S.).

Labrus mixtus, Frees and Eks.—Occasionally in Loch Fyne, at the mouth of East Loch Tarbert (B. & S.).

Ctenolabrus rupestris, Linné.—Common, especially near Skate Island, Loch Fyne (B. & S.).

Centrolabrus exoletus, Linné.—Taken occasionally in Loch Fyne (B. & S.).

Gadus morhua, Linné.—Not very abundant in Loch Fyne (B. & S.). Upper Loch Fyne, east side, in 10 to 20 fathoms (M.). In Loch Gair, off Ardno, Kinglass Spit, and off Carndow (G.).

Gadus aeglefinus, Linné.—Not abundant in Loch Fyne (B. & S.). Upper Loch Fyne, in the centre, in 65 to 70 fathoms (M.). Between Penmore and Inveraray (G.).

Gadus luscus, Linné.—Occasionally in Tarbert Harbour (B. & S.). Tarbert Bank, Lower Loch Fyne; and between Dunderave and Carndow, Upper Loch Fyne (G.).

Gadus minutus, Linné.—Frequent in Tarbert Harbour (B. & S.). Upper Loch Fyne, in the centre, near the head (M.). Off Lowburn, Upper Loch Fyne (G.). Tarbert, Loch Fyne (Dr Scouler).

Gadus merlangus, Linné.—Not abundant in Loch Fyne (B. & S.). Upper Loch Fyne, in the centre (M.). Two nearly ripe males were taken in the trawl-net in May 1896 (G.).

Gadus virens, Linné.—Abundant, but mostly immature; these immature forms—termed ‘podlies’—frequent the shallow in-shore water, especially in the neighbourhood of wharfs or piers.

Gadus pollachius, Linneé.—This species is also of more or less frequent occurrence, but is usually of small size; large specimens are, however, occasionally brought to East Tarbert.

Molva vulgaris, Fleming.—Frequently brought into Tarbert by the fishermen (B. & S.). A ripe male, 38 inches in length, was taken by trawl-net near the head of Loch Fyne in May 1896 (G.).

Merluccius vulgaris, Cuvier.—Upper Loch Fyne, in the centre, in 34 to 36 fathoms (M.). In the vicinity of Furnace, and between Dunderave and Carndow, taken with the beam-trawl (G.).

Motella mustela, Linné.—Taken between tide-marks in East Loch Tarbert, not common (B. & S.).

Raniceps trifurcatus, Yarrell.—Loch Fyne (Dr Scouler, in *Trans. of Nat. Hist. Soc. of Glasgow*, vol. i., p. 8).

Ammodytes lanceolatus, Lesauvage.—Occasionally in the neighbourhood of East Loch Tarbert (B. & S.).

Hippoglossus vulgaris (Fleming).—Occasionally taken in Loch Fyne (B. & S.).

Hippoglossoides limandooides (Bloch).—Upper Loch Fyne, east side and centre, in 10 to 70 fathoms (M.). Tarbert Bank, Lower Loch Fyne ; off Minard ; off Castle Lachlan ; Inveraray Bay ; and between Dunderave and Lowburn, Upper Loch Fyne (G.). A common and widely-distributed species.

Rhombus maximus (Linné).—Occasionally taken in Loch Fyne (B. & S.).

Zeugopterus unimaculatus (Risso).—A few specimens of this interesting species were taken near Barmore (B. & S.).

Zeugopterus punctatus (Bloch).—Upper Loch Fyne, west side, in 10 to 25 fathoms (M.).

Pleuronectes platessa (Linné).—More or less common in Loch Fyne where the conditions are suitable. Upper Loch Fyne, on west and east sides and centre, in 10 to 36 fathoms (M.). A number of large plaice, measuring from 14 to 18 inches in length, and most of which were either spawning or spent, were captured in the trawl-net near the head of Loch Fyne in May 1896 (G.).

Pleuronectes microcephalus, Donovan.—Frequent in suitable localities (B. & S.). On May 6, 1896, a scarcely ripe female, 13 inches in length, was taken near the head of the loch ; two nearly ripe specimens—one a male 13 inches in length, the other a female 17 inches in length—were captured at Kinglass Spit ; and another, 11 inches, was taken off Ardno. On the 7th, several other specimens were trawled on Tarbert Bank, Lower Loch Fyne (G.).

Pleuronectes cynoglossus (Linné).—Upper Loch Fyne, at west side and centre, in 15 to 36 fathoms (M.). Moderately common in deep water, from off Inveraray to the head of the loch (G.).

Pleuronectes limanda, Linné (= (?) *Hippoglossoides platessoides*).—Barmore Bay, Lower Loch Fyne (B. & S.). Upper Loch Fyne, west and east sides and centre, in 10 to 70 fathoms (M.). Lowburn to Dunderave, off Inveraray, Kinglass Spit, off Castle Lachlan, off Minard, Ardrishaig Bay, Tarbert Bank. Common all over the Loch (G.).

Pleuronectes flesus, Linné.—Common in Tarbert Harbour (B. & S.). Occasionally in Upper Loch Fyne. One specimen, a scarcely ripe male, was taken near the head of the loch in May 1896, and another off Largymore (G.).

Solea vulgaris, Quensel.—Small specimens have been captured in Barmore Bay (B. & S.).

Salmo salar, Linné.—Taken occasionally in herring-nets between Tarbert and Barmore (B. & S.).

Salmo trutta, Linné.—Regularly taken in small quantities just outside East Loch Tarbert (B. & S.).

Clupea harengus, Linné.—The herring usually enters Loch Fyne in May, and the fishing usually continues till November (B. & S.).

Anguilla vulgaris, Turton.—The common eel affords a small but regular fishery in Tarbert Harbour (B. & S.). One specimen was taken in the shrimp trawl-net in Inveraray Bay in May 1896 (G.).

Conger vulgaris, Cuvier.—Frequent in Loch Fyne, but small (B. & S.).

Siphonostoma typhle (Linné).—Captured in East Loch Tarbert amongst *Zostera* (B. & S.).

Syngnathus acus, Linné.—Generally distributed throughout the loch, especially inshore, where the water is shallow.

Nerophis ocequoreus (Linné).—East Loch Tarbert, amongst *Zostera* (B. & S.).

Nerophis lumbriciformis (Willughby).—In East Loch Tarbert, amongst *Zostera*, with the previous species (B. & S.).

GANOIDÆ.

Acipenser sturio, Linné.—Fine specimens are often noticed during the herring fishery, but are seldom captured (B. & S.).

ELASMOBRANCHII.

Pristiurus melanostomus (Bonaparte).—Occasionally brought in amongst the *Acanthii* in the winter fishing (B. & S.). Upper Loch Fyne, east side, in 10 to 20 fathoms (M.).

Acanthius vulgaris, Risso.—Frequent during the herring fishing. They are occasionally the cause of serious injury to the herring-nets. Upper Loch Fyne, east side, in 10 to 20 fathoms (M.).

Raia clavata, Linné.—Frequent during the winter fishing (B. & S.). Occasionally in Upper Loch Fyne (G.).

Raia maculata, Montagu.—Upper Loch Fyne, east side, in 10 to 20 fathoms (M.).

Raia circularis, Couch.—Between Loch Gair and Largymore. Taken with the beam-trawl (G.).

TUNICATA OF LOCH FYNE.

Comparatively little appears to have yet been done towards the investigation of the Loch Fyne Tunicates. This group is a somewhat difficult one to study; and in the discrimination of many of the species, and especially of the *Botrylloidea*, it is all but absolutely necessary that living specimens should be available. Nine species are here recorded, and, with one exception, these records are all obtained from the MS. notes of the

steam yacht 'Medusa.' The number of species will doubtless be considerably increased when the Tunicata come to be more thoroughly worked up.

LARVACEA.

Oikopleura (?) flabellum, J. Müller.—Lower Loch Fyne in surface tow-net; Upper Loch Fyne, near Minard, in bottom tow-net (G.).

ASCIDIACEA.

Botrylloides, sp.—Upper Loch Fyne, west side, in about 15 fathoms.

Ciona intestinales, Linné.—Upper Loch Fyne, in the centre, in 60 to 65 fathoms (M.).

Ascidia virginea, O. F. Müller.—Upper Loch Fyne, at Minard Narrows; on both sides and centre, in 10 to 70 fathoms; and also on the shore (M.).

Ascidia scabra, O. F. Müller.—Upper Loch Fyne, at Minard Narrows, and on the east side and centre, in 12 to 65 fathoms (M.).

Ascidia mentula, O. F. Müller.—Upper Loch Fyne, at Minard; and on both sides and centre, in about 10 fathoms (M.). Tarbert Bank, Lower Loch Fyne; and in East Loch Tarbert, frequent and large (Mihi).

Corella parallelogramma, O. F. Müller.—In the centre of Upper Loch Fyne, in 60 to 65 fathoms (M.).

Styelopsis grossularia (Van Beneden).—At Minard Narrows, Upper Loch Fyne, on the east side, and in the centre, in 10 to 36 fathoms; and also on the shore (M.).

Polycarpa rustica, Linné.—At Minard Narrows, Upper Loch Fyne, west and east sides and centre, in 10 to 70 fathoms (M.).

MOLLUSCA OF LOCH FYNE.

Note.—The arrangement and nomenclature of Part IV. of the Rev. A. M. Norman's Catalogues (Museum Normanianum) are followed for the Mollusca. The *Revision of British Mollusca*, by the same author, as far as, and inclusive of, Order III. (Nudibranchiata),* has also been consulted; also the *Mollusca of the Firth of Clyde*, by Alfred Brown.

CEPHALOPODA.

Octopus vulgaris, Lamk.—In herring-net in the summer, Laggan Bay (B. & S.).

Scæurgus cirrhosa (Lamk.). Taken in herring-net in Laggan Bay, in December; young specimen (B. & S.); east side of Upper Loch Fyne, 30 fathoms (M.).

* *Revision of British Mollusca, Ann. and Mag. Nat. Hist.*, sixth series, vol. v. pp. 452–484, and vol. vi. pp. 60–91 (1890).

Sepiola Rondeletii, Leach.—Laggan Bay ; eggs frequent, attached to Ascidians and other objects (B. & S.) ; west and east sides of Upper Loch Fyne, 10 to 30 fathoms (M.).

Rossia macrosoma (D. Ch.).—Laggan Bay (B. & S.). Mid-channel, near the head of Upper Loch Fyne (M.).

Rossia Oweni, Ball.—Off Minard, and at east side of Upper Loch Fyne, 10 to 30 fathoms (M.). Dr Jeffreys says that Steenstrup considers *R. Oweni* of Ball to be the male of *R. macrosoma*.*

PTEROPODA.

Limacina retroversa (Flem.). Occasionally taken with the tow-net in Loch Fyne.

OPISTHOBRANCHIATA.

Actæon tornatilis (Linné).—Laggan Bay, Loch Fyne (B. & S.). Ardrishaig, dead specimens (Alf. Brown). Upper Loch Fyne, at Minard Narrows, in 12 fathoms (M.). Variety, *bulloformis*, Jeffreys, in Loch Fyne, in 40 to 50 fathoms, muddy bottom (M'Nab ; see Jeffreys' *Brit. Conch.*, vol. iv., p. 435).

Tornatina obtusa (Montagu).—Off Silvercraigs, Loch Fyne (Alf. Brown). Loch Fyne (Robertson).

Tornatina mamillata (Philippi).—Off Silvercraigs, Loch Fyne ; scarce in the living state ; dead shells not uncommon (Alf. Brown).

Tornatina truncatula (Bruguiere). East Loch Tarbert (B. & S.). Off Silvercraigs (Alf. Brown).

Tornatina umbilicata (Montagu). In Upper Loch Fyne, at Minard Narrows, and on the west side and centre in 15 to 70 fathoms. Var. *strigella*, Lovén, has been taken on the east side in 20 fathoms (M.).

Tornatina nitidula, Lovén.—Loch Fyne (Mr Barlee and Dr J. G. Jeffreys). East side of Upper Loch Fyne, in 15 fathoms (M.).

Volvula acuminata (Bruguiere).—Loch Fyne (Barlee, Alder, J. G. Jeffreys, Robertson).

Cyllichna cylindracea (Pennant).—Tarbert Bank (Mihi). In Upper Loch Fyne at Minard Narrows, and at both sides and centre in 10 to 70 fathoms (M.). Loch Fyne (Jeffreys ; var., *linearis*).

Diaphana hyalina (Turton).—East Loch Tarbert (B. & S.). Moll Dhu and Silvercraigs, Loch Fyne (Alf. Brown).

Scaphander lignarius (Linné). Furlong Bay, and off Moll Dhu Point in 15 fathoms (B. & S.). Off Silvercraigs and Otter Spit, Loch Fyne (Alf. Brown). In Upper Loch Fyne, on both sides, in 10 to 15 fathoms (M.).

* *British Conchology*, vol. v. p. 134. See also the *Revision of British Mollusca*, already referred to.

Bulla utriculus, Brocchi.—Tarbert Bank, Loch Fyne (Mihi). Dr Jeffreys dredged a single specimen of the variety *oblonga* in Loch Fyne, (*Brit. Conch.*, vol. iv. 441).

Haminea hydatis (Linné).—Has hitherto been found only in the deep water of Upper Loch Fyne (M.).

Acera bullata, Müller.—East Loch Tarbert—living (Mihi).

Philine scabra (Müller).—Tarbert Bank, Loch Fyne—living (Mihi). In Upper Loch Fyne, both sides, in 10 to 20 fathoms (M.).

Philine catena (Montagu).—In the centre of Upper Loch Fyne, in 35 fathoms (M.).

Philine punctata (Clark).—Found in deep water (70 fathoms), Upper Loch Fyne (M.).

Philine pruinosa (Clark).—Loch Fyne (Barlee).

Aplysia punctata, Cuvier.—White Shore, E. Loch Tarbert, rare (B. & S.).

Pleurobranchus plumula (Montagu).—Between tide-marks and dredged, East Loch Tarbert (B. & S.).

Runcina coronata (Quatrefages) (= *R. Hancocki*, Forbes).—Shallow water amongst weed in East Loch Tarbert, rare (Mihi).

NUDIBRANCHIATA.

Doris tuberculata, Cuvier.—Frequent in East Loch Tarbert (B. & S.). Shore, Upper Loch Fyne (M.).

Doris repanda, Alder and Hancock.—East Loch Tarbert, rare (B. & S.). This species is readily distinguished by its white colour, and by the row of spots along each side.

Doris Johnstoni, Alder and Hancock.—East Loch Tarbert—frequent (B. & S.). Shore, Upper Loch Fyne (M.).

Acanthodoris pilosa (Müller).—Occasionally in East Loch Tarbert (B. & S.).

Goniodoris nodosa (Montagu).—East Loch Tarbert, between tide-marks (B. & S.).

Triopa clavigera (Müller).—Between tide-marks, East Loch Tarbert; not common (B. & S.).

**Polycera quadrilineata* (Müller).—East Loch Tarbert (B. & S.). Both the ordinary form and a dark-coloured variety were occasionally obtained.

Aegirius punctilucens (D'Orbigny).—Obtained occasionally on the under-side of stones in East Loch Tarbert (B. & S.).

**Polycera ocellata*, Alder and Hancock, has also been obtained in East Loch Tarbert.

Tritonia Hombergi, Cuvier.—Obtained in the vicinity of Minard, Upper Loch Fyne, in 11 to 25 fathoms (M.).

Dendronotus frondosus (Ascanius) [= *D. arborescens* (Müller)].—Frequent in Loch Fyne in 10 to 20 fathoms (B. & S.).

Eolis papillosa (Linné).—Frequent between tide-marks in East Loch Tarbert (B. & S.).

Galvina picta, Alder and Hancock (= *Eolis picta*), Alder and Hancock.—Obtained in East Loch Tarbert ; rare.

Galvina Farrani, Alder and Hancock (= *Eolis farrani*), Alder and Hancock).—Rare in East Loch Tarbert (B. & S.). One specimen, of a rich orange colour.

Favorinus albus, Alder and Hancock (= *Eolis alba*), Alder and Hancock.—Frequent amongst *Zostera* in East Loch Tarbert (B. & S.).

Facelina Drummondii (W. Thompson) (= *Eolis Drummondii*, W. Thompson).—Moderately common amongst *Zostera* in East Loch Tarbert (B. & S.). On the shore between tide-marks, Upper Loch Fyne (M.).

Hermaea bifida (Montagu).—East Loch Tarbert ; rare (B. & S.).

Alderia modesta (Lovén).—Amongst *Zostera* near the head of East Loch Tarbert (Mihi).

Elysia viridis (Montagu).—Common amongst *Zostera* in East Loch Tarbert. Colour variable from pale green to brown (B. & S.).

PULMONATA.

Alexia bidentata (Montagu).—Common under stones between tide-marks, East Loch Tarbert, especially round towards Garvald Point (B. & S.).

Oncidium celticum, Cuvier.—Shore, Upper Loch Fyne (M.). Only two British localities are mentioned by Dr Jeffreys for this species—viz., Lantivet Bay, Cornwall ; and Whitsand Bay, near Plymouth.

PROSOBRANCHIATA.

Clathurella linearis (Montagu).—Off Battle Island, Loch Fyne, and in East Loch Tarbert ; dead shells occasionally containing small hermit crabs (B. & S.).

Clathurella purpurea (Montagu).—West side of Upper Loch Fyne, 10 to 20 fathoms (M.).

Clathurella reticulata (Renier).—West side of Upper Loch Fyne, 12 to 15 fathoms (M.).

Clathurella teres (Forbes).—In the vicinity of Minard, Upper Loch Fyne, 12 to 15 fathoms (M.). East Loch Tarbert (Mihi).

Mangelia attenuata (Montagu).—In the vicinity of Minard, in 15 to 20 fathoms (M.).

Mangelia lœvigata (Philippi).—In the same locality as the last (M.).

Bela turricolla (Montagu).—East Loch Tarbert (living); off Battle Island, dead (B. & S.); Upper Loch Fyne, in the vicinity of Minard, on both east and west sides and in the centre, in 11 to 70 fathoms (M.).

Bela Trevellyana (Turton).—Upper Loch Fyne, in 11 to 20 fathoms (M.).

Neptunea antiqua (Linné).—Taken in the vicinity of Minard; on the east and west sides and centre, and near the head of the loch, in 10 to 70 fathoms, and between tide-marks (M.). East Loch Tarbert, living (Mihi).

Sipho gracilis (Da Costa).—Loch Fyne (B. & S.). Vicinity of Minard; on the east and west sides and centre; and near the head of the loch in 10 to 70 fathoms (M.).

Buccinum undatum, Linné.—East Loch Tarbert (B. & S.). At various places from the vicinity of Minard to near the head of the loch, and from between tide-marks down to 70 fathoms (M.). In deep water, Upper Loch Fyne (G.).

Nassa incrassata (Ström).—East Loch Tarbert (B. & S.). Minard, in 12 to 20 fathoms, and between tide-marks (M.).

Nassa reticulata (Linné).—East Loch Tarbert (B. & S.). Minard, in 12 to 20 fathoms, and between tide-marks (M.).

Nassa pygmæa (Lamarck).—In the vicinity of Minard, in 11 to 20 fathoms (M.).

Trophon truncatus (Ström).—Tarbert Bank, Loch Fyne; not very rare in suitable localities.

Trophon muricatus (Montagu).—In Upper Loch Fyne, in 12 to 25 fathoms (M.). Tarbert Bank, Loch Fyne (Mihi). Alfred Brown does not include this species in his work on the *Mollusca of the Clyde*, probably because *Trophon clathratus* may sometimes have been mistaken for it. I have both species in my collection, and when they are placed side by side the difference between them is quite apparent. There can be no doubt that the specimen from Tarbert Bank is *Trophon muricatus*.

Purpura lapillus (Linné).—Commonly distributed, especially in shallow water. Vicinity of Minard, in 12 to 20 fathoms (M.).

Trivia europaea (Montagu).—On rocks at extreme low water in Loch Fyne, also in East Loch Tarbert, living (B. & S.). West side, Upper Loch Fyne, in 10 to 25 fathoms, and also on the shore (M.).

Aporrhais pes-pellicani (Linné).—Furlong Bay; off Battle Island, &c. (B. & S.). Minard; west and east side and centre; and near the head of the loch, in 10 to 70 fathoms (M.).

Triforis perversa, Linné.—Tarbert Bank, Loch Fyne, dead shell (Mihi).

Cerithiopsis tubercularis (Montagu).—East Loch Tarbert (B. & S.). Living shells not very common.

Trichotropis borealis, Broderip and Sowerby.—Furlong Bay, Loch Fyne (B. & S.). Minard, west side and centre, in 11 to 35 fathoms (M.).

Turritella terebra (Linné).—East Loch Tarbert, dead shells (B. & S.). Minard, west and east sides, in 10 to 30 fathoms (M.).

Cæcum glabrum (Montagu).—Loch Fyne and East Loch Tarbert; not common (B. & S.).

Littorina littorea (Linnaeus).—Common, especially between tide-marks (B. & S.). On west and east sides of Upper Loch Fyne, 10 to 25 fathoms, and on the shore (M.).

Littorina rufa (Maton).—Common between tide-marks (B. & S.).

Littorina obtusata (Linnaeus).—Common between tide-marks. The variety *ornata*, Jeffreys, is also occasionally obtained; specimens of the variety were collected at 'White Shore,' East Loch Tarbert (B. & S.). West and east sides and centre, and near the head of Upper Loch Fyne, in 10 to 20 fathoms; and also on the shore (M.).

Lacuna pallidula (Da Costa).—Taken on *Laminaria* in Loch Fyne, in shallow bays in the vicinity of East Loch Tarbert (B. & S.). The variety *albescens*, Jeffreys, was also occasionally obtained (B. & S.).

Lacuna divaricata (Fabricius).—Off Battle Island, Loch Fyne, and East Loch Tarbert. The variety *canalis* (Montagu) was obtained in East Loch Tarbert (B. & S.). West and east sides and centre of Upper Loch Fyne, and near the head of the loch, in 10 to 20 fathoms (M.).

Skenea planorbis (Fabricius).—Common; Loch Fyne and East Loch Tarbert (B. & S.).

Homogyra atomus (Philippi).—East Loch Tarbert; not very common (B. & S.).

Zippora membranacea (Adams).—Common amongst *Zostera* in East Loch Tarbert (B. & S.). The specimens were usually thin, and without, or with nearly obsolete, ribs; they are probably the variety *elata* of Philippi.

Rissoa parva (Da Costa).—Loch Fyne and East Loch Tarbert, amongst weed in shallow water.

Rissoa violacea, Desmarests.—East Loch Tarbert, between tide-marks, and dredged (B. & S.). Off Silvercraigs, Loch Fyne (Alf. Brown). Head of Upper Loch Fyne (G.).

Alvania cancellata (Da Costa).—Loch Fyne (Jeffreys and Barlee).

Alvania reticulata (Montagu).—Off Battle Island, Loch Fyne (B. & S.). In the vicinity of Minard, in 12 to 15 fathoms (M.). Off Silvercraigs, Loch Fyne (Alf. Brown).

Alvania abyssicola, Forbes.—Loch Fyne, amongst mud, in 50 to 100 fathoms (M'Andrew and Forbes, A. M. Norman, and others).

Alvania carinata (Da Costa) [= *Rissoa striatula* (Montagu)].—‘I obtained a single dead specimen and some fragments off Silvercraigs, Loch Fyne, in about 12 fathoms nullipore and sand’ (Alf. Brown, in *Mollusca of the Firth of Clyde*, p. 62).

Flemingia zetlandica (Montagu).—Tarbert Bank, Loch Fyne (Mihi). In 20 fathoms, off Silvercraigs, Loch Fyne (Alf. Brown).

Cingula trifasciata (Adams) [= *Rissoa cinguillus* (Montagu)].—Common in Loch Fyne and East Loch Tarbert (B. & S.).

Onoba striata (Adams).—Common between tide-marks and in shallow water, especially where there is a weedy bottom, Loch Fyne and East Loch Tarbert (B. & S.).

Hydrobia stagnalis (Bast.) [= *H. ulvae* (Penn.)].—At the head of Upper Loch Fyne (G.).

Capulus hungaricus (Linné).—Furlong Bay in 15 fathoms (B. & S.). Vicinity of Minard, west and east sides, in 10 to 25 fathoms (M.).

Velutina laevigata (Pennant).—East Loch Tarbert (B. & S.). In Upper Loch Fyne, at Minard, on both the west and east sides, in the centre, and near the head of the loch, in 10 to 70 fathoms (M.). Off Moll Dhu and Silvercraigs (Alf. Brown).

Velutella flexilis (Montagu) [= *Velutina plicatilis* (Müller)].—‘One specimen in Loch Fyne, on stony ground, in 25 fathoms’ (Forbes and M'Andrew ; see *Mollusca of the Firth of Clyde*, by Alf. Brown, p. 83).

Lamellaria perspicua (Linné).—East Loch Tarbert, on stones between tide-marks, frequent (B. & S.). Off Silvercraigs (Alf. Brown).

Lunatia (Natica) sordida (Philippi).—Taken in the vicinity of Minard in 15 to 20 fathoms (M.).

Lunatia pulchella (Risso) [= *Natica Alderi*, Forbes].—East Loch Tarbert and off Battle Island, Loch Fyne (B. & S.). In the vicinity of Minard, west and east sides and centre, and also near the head of Upper Loch Fyne, in 5 to 30 fathoms (M.).

Adeorbis subcarinatus (Montagu).—A few dead specimens were obtained in the coralline zone off Silvercraigs, Loch Fyne, by Alfred Brown (*Mollusca of the Firth of Clyde*, p. 82).

Aclis supranitida (S. Wood).—Tarbert Bank, Loch Fyne ; rare (Mihi).

Eulima polita (Linné).—West and east sides and centre of Upper Loch Fyne, in 10 to 65 fathoms (M.). Off Moll Dhu and Silvercraigs (Alf. Brown).

Eulima intermedia, Cantraine ; var. *rubro-tincta* (Jeff.).—Loch Fyne (Jeffreys, see *Brit. Conch.*, vol. iv. p. 204).

Eulima incurva (Ren.) [= *Eulima distorta* (Deshayes)]. East Loch Tarbert (B. & S.). West and east sides and centre of Upper Loch Fyne, in 10 to 35 fathoms (M.).

Eulima bilineata, Alder.—West side of Upper Loch Fyne, in 10 to 15 fathoms (M.). Off Silvercraigs, one living, and a few dead specimens (Alf. Brown).

Turbonilla rufa (Philippi).—Taken alive off the pier at Ardrishaig in 5 fathoms, where it is rather common (Alf. Brown).

Parthenia interstincta (Montagu).—Tarbert Bank, Loch Fyne (Mihi).

Parthenia rufescens (Forbes).—Off Silvercraigs, Loch Fyne, dead shells only (Alf. Brown as *Odostomia scalaris*; variety, *rufescens*). Upper Loch Fyne, in 12 to 25 fathoms (M.). Dr Jeffreys in *British Conchology*, vol. iv. p. 161, and Alfred Brown in the *Mollusca of the Firth of Clyde*, p. 77, consider *Parthenia* (*Odostomia*) *rufescens* to be only a variety of *Parthenia* (*Odostomia*) *scalaris* (Philippi).

Parthenia spiralis (Montagu).—Loch Fyne and East Loch Tarbert; not uncommon (B. & S.).

Odostomia conspicua, Alder.—Loch Fyne (M'Nab; see Jeffreys' *Brit. Conch.*, vol. iv. p. 133).

Odostomia unidentata (Montagu).—Loch Fyne and East Loch Tarbert (B. & S.).

Odostomia acuta, Jeffreys.—Loch Fyne (Barlee).

Odostomia pallida (Montagu).—Off Moll Dhu and Silvercraigs, Loch Fyne (Alf. Brown). Usually found on the shells of living *Pecten opercularis*, and sometimes on *Pecten maximus*.

Odostomia umbilicaris (Malm).—Loch Fyne (Barlee, see Jeffreys' *op. cit.*, vol. iv. p. 130).

Auriculina (*Odostomia*) *obliqua* (Alder).—Tarbert Loch Fyne.

Auriculina insculpta (Montagu).—Off Silvercraigs, Loch Fyne, living shells (Alf. Brown).

Eulimella (*Odostomia*) *Scillæ* (Leacchi).—Off Silvercraigs, Loch Fyne, in sand and nullipore (Alf. Brown).

Eulimella acicula (Philippi).—Tarbert, Loch Fyne (Robertson; see Brown's *Mollusca of the Firth of Clyde*, p. 78).

[*Molleria costulata* (Möller).—A single specimen, dead but perfect, off Silvercraigs, Loch Fyne, in 12 fathoms nullipore (Alf. Brown). Probably a post-tertiary fossil, as suggested by Mr Brown.]

Cyclostrema nitens (Philippi).—Off Silvercraigs, Loch Fyne, living (Alf. Brown).

Zizyphinus zizyphinus (Linné).—Laggan Bay and other localities in Loch Fyne (B. & S.). Off Moll Dhu, Loch Fyne (Alf. Brown).

Zizyphinus millegranus (Philippi).—Off Battle Island (B. & S.). Fairly abundant at Minard Narrows, Upper Loch Fyne, and along the sides of the loch, in 10 to 25 fathoms (M.). Fine specimens obtained off Silvercraigs, where the species is plentiful (Alf. Brown).

Zizyphinus Montagui (W. Wood).—Off Otter, Loch Fyne ; a few dead specimens (Alf. Brown).

Gibbula magus (Linné).—White Shore, East Loch Tarbert and Loch Fyne (B. & S.). Has been found in Upper Loch Fyne in 10 fathoms (M.).

Gibbula umbilicata (Montagu).—Common near low-water mark East Loch Tarbert (B. & S.). Taken in Upper Loch Fyne, near the head, in shallow water (M.).

Gibbula cineraria (Linné).—Common in East Loch Tarbert (B. & S.). Vicinity of Minard, west and east sides and centre, and near the head of Upper Loch Fyne, in 5 to 70 fathoms (M.).

Gibula tumida (Montagu).—East Loch Tarbert (B. & S.). Vicinity of Minard, west and east sides and centre of Upper Loch Fyne, in 10 to 20 fathoms (M.). Off Silvercraigs (Alf. Brown).

Margarita helicina (Fabricius).—East Loch Tarbert (B. & S.). This species was not uncommon at extreme low-water on the fronds of *Laminaria* and on boulders, both in East Loch Tarbert and in the neighbouring bays in Loch Fyne.

Emarginula crassa, J. Sowerby.—Off Battle Island, dead shells (B. & S.). Upper Loch Fyne at Minard Narrows, and on both sides, in depths of 10 to 20 fathoms (M.).

Emarginula fissura (Linné).—Off Battle Island, and in other localities ; dead shells (B. & S.). Upper Loch Fyne at Minard Narrows, and on both sides and in the centre of the loch, as well as on the shore (M.).

Puncturella noachina. (Linné).—Laggan Bay (B. & S.). In Upper Loch Fyne at Minard Narrows, and on both sides, in 10 to 30 fathoms (M.).

Acmaea testudinalis (Müller).—White Shore, East Loch Tarbert (B. & S.). In Upper Loch Fyne, on the shore (M.).

Pilidium fulvum (Müller).—Tarbert Bank, Loch Fyne (Mihi). Off Moll Dhu and Silvercraigs (Alf. Brown).

Helcion pellucidum (Linné).—White Shore, East Loch Tarbert ; var. *lævis* (B. & S.).

Patella vulgata, Linné.—Common throughout the district on stones between tide-marks.

POLYPLACOPHORA.

Chiton fascicularis, Linné.—East Loch Tarbert ; rare (B. & S.).

Chiton cinereus, Linné.—In Upper Loch Fyne at Minard Narrows, in 15 to 20 fathoms (M.).

Chiton marginatus, Pennant.—White Shore, East Loch Tarbert (B. & S.). In Upper Loch Fyne at Minard Narrows, on the west and east sides and centre, in 10 to 36 fathoms, and on the shore (M.).

Chiton ruber, Linné.—Under stones between tide-marks (B. & S.). In Upper Loch Fyne at Minard Narrows, on both sides, in 10 to 20 fathoms, and on the shore (M.). Off Moll Dhu (Alf. Brown).

Chiton marmoratus, Fabricius.—East Loch Tarbert (B. & S.). Has been found abundantly in Achagoil Bay, in Upper Loch Fyne (M.).

SCAPHOPODA.

Dentalium entalis, Linné.—Common off Barimore and in other localities (B. & S.). In Upper Loch Fyne at Minard Narrows, and on both sides and centre, in 10 to 70 fathoms (M.).

**Siphonodentalium (Pulsellum) lofotense*. M. Sars.—Lower Loch Fyne (Robertson, in *Trans. Nat. Hist. Soc. Glasgow*, vol. ii., N.S., p. 151).

PELECYPODA.

Tetrabranchia.

Anomia ephippium, Linné.—Common in the Loch Tarbert district (B. & S.). In Upper Loch Fyne at Minard Narrows, and on both sides and centre, in 10 to 65 fathoms—the variety *striata* at Minard and on the east side, in 12 to 20 fathoms (M.).

Anomia patelliformis, Linné.—In Upper Loch Fyne at Minard Narrows, and on the east side in 10 to 20 fathoms (M.).

Ostrea edulis, Linné.—Generally distributed in the Tarbert district, but small and scarce, the variety *deformis*, Jeff., between tide-marks East Loch Tarbert (B. & S.). Upper Loch Fyne, between tide-marks, both the ordinary form and the variety *parasitica*, Turt. (M.). Loch Fyne near Tarbert (Alf. Brown).

Lima hians (Gmelin).—Off Battle Island, in 40 fathoms (B. & S.). In Upper Loch Fyne, near the shore on both sides, in about 15 fathoms (M.).

Lima subauriculata (Montagu).—Off Battle Island in 40 fathoms—dead shells (B. & S.). Off Silvercraigs, Loch Fyne; common in 10 fathoms in muddy sand and shells (Alf. Brown).

Lima Loscombi, G. B. Sowerby.—Rather rare in Upper Loch Fyne, in 10 to 15 fathoms on the west side (M.).

Pecten maximus (Linné).—Off Skate Island in 14 fathoms, and in other localities, but not very plentiful (B. & S.). Living specimens have been taken in Upper Loch Fyne (M.). Off Moll Dhu and Silvercraigs, Loch Fyne (Alf. Brown). Adult living specimens have been taken in East Loch Tarbert (Mihi).

Pecten varius, Linné.—East Loch Tarbert (B. & S.). Found abund-

* Dr Robertson (*op. cit.*, p. 152) also records the discovery of *Siphonodentalium (Pulsellum) affine*, M. Sars, 'off Skate Island at the mouth of Loch Fyne, in 90 to 100 fathoms.'

antly at extreme low water in Upper Loch Fyne (M.). In 10 fathoms, off Silvercraigs, in stony and shelly ground—young live specimens only (Alf. Brown).

Pecten tigrinus, O. F. Müller.—Not uncommon off Battle Island in 40 fathoms, both the typical form and the variety *costatus*, Jeff. (B. & S.). In Upper Loch Fyne at Minard Narrows, and at both sides, in 10 to 30 fathoms (M.).

Pecten striatus, O. F. Müller.—Furlong Bay and Moll Dhu Point, not common (B. & S.). Upper Loch Fyne at Minard Narrows, at both sides and in the centre, and also near the head of the loch, in 10 to 30 fathoms (M.).

Pecten pusio (Linné).—A few off Skate Island in 14 fathoms, and in East Loch Tarbert (B. & S.). Upper Loch Fyne at Minard Narrows, and on the east side in 10 to 25 fathoms, as well as also between tide marks (M.).

Pecten pes-lutrae (Linné), (= *Pecten septemradiatus*, Müller).—Common in Upper Loch Fyne in the deepest water, where also the largest specimens are found. Very large and fine specimens were taken below Strachur—much finer than towards the head of the loch—the specimens procured towards the head of the loch in about 10 fathoms, and at Minard Narrows, being smaller than those from the deep water. All the specimens taken in a haul off Skate Island in 104 fathoms were dead. In deep water the shells are always associated with much manganese (M.). Plentiful in deep water off Skate Island (B. & S.).

The variety *albus*, Jeff., is not very rare in Loch Fyne ; perhaps one in every fifty belongs to this variety (M.).

The variety *Dumasii*, Payr., has been taken in Upper Loch Fyne in 70 fathoms (M.).

Pecten opercularis (Linné).—Common in the neighbourhood of Tarbert (B. & S.). Upper Loch Fyne at Minard Narrows ; at both sides and in the centre, and also near the head in 10 to 70 fathoms ; and also on the shore between tide marks (M.). At Moll Dhu and Silvercraigs (Alf. Brown).

Pecten similis, Laskey.—Dredged at Tarbert Bank, Loch Fyne (Mihi). A local and gregarious species, Moll Dhu, Loch Fyne (Alf. Brown). The fry of *Pecten maximus* are liable to be mistaken for this species by those who have not had an opportunity of seeing both forms.

Mytilus edulis, Linné.—Found at the heads of all the Clyde lochs. This is a widely distributed species both in the northern and southern hemispheres ; it has been recorded from Rio de la Plata, Falkland, and Kerguelen Islands, and from New Zealand (M.). There is an extensive bed of *Mytilus edulis* at Ardrishaig (Alf. Brown).

Modiola modiolus (Linné).—Common in the neighbourhood of East Loch Tarbert (B. & S.). Abundant at extreme low water in all the Clyde lochs, also at Minard Narrows, and at both sides of Upper Loch Fyne in 10 to 30 fathoms (M.).

Modiolaria marmorata (Forbes).—Common ; usually found embedded

in the test of large Ascidiens which are frequent on Tarbert Bank, in Loch Fyne, and common at extreme low water in East Loch Tarbert (B. & S.). Upper Loch Fyne at Minard Narrows, in 12 to 20 fathoms (M.). Moll Dhu, Loch Fyne (Alf. Brown).

Modiolaria discors (Linné).—Attached to the roots of *Laminaria* and other algæ in East Loch Tarbert, and in neighbouring bays in Loch Fyne (B. & S.).

Nucula nucleus.—(Linné).—Upper Loch Fyne at Minard Narrows, in 12 to 20 fathoms (M.).

Nucula sulcata, Brown.—Upper Loch Fyne at Minard Narrows, in 12 to 15 fathoms (M.). Tarbert, Loch Fyne (Barlee).

Nucula nitida, G. B. Sowerby.—Battle Island; not common (B. & S.). Upper Loch Fyne at Minard Narrows, and on the west and east sides and in the centre, in 10 to 70 fathoms (M.).

Nucula tenuis (Montagu).—Occasionally off Battle Island (B. & S.). On both sides and in the centre of Loch Fyne, in 10 to 70 fathoms (M.). Locally plentiful opposite Otter, Loch Fyne (Alf. Brown).

Leda minuta (O. F. Müller).—Off Battle Island (B. & S.). Abundant in Lower Loch Fyne in 100 to 105 fathoms (M.).

Astarte sulcata (Da Costa).—Laggan Bay and East Loch Tarbert (B. & S.). Upper Loch Fyne at Minard Narrows, and on both sides and in the centre, in 11 to 70 fathoms (M.). Off Otter Spit and Moll Dhu (Alf. Brown).

Astarte elliptica (Brown).—Laggan Bay (B. & S.). Upper Loch Fyne at Minard Narrows, and on the east side in 10 to 20 fathoms; also in Lower Loch Fyne in 12 fathoms (M.). This, which is sometimes described as a variety of *Astarte sulcata*, is reinstalled to specific rank in Dr Norman's catalogue.

Astarte compressa (Montagu).—Upper Loch Fyne at Minard Narrows, in 11 to 20 fathoms, abundant (M.). In sand and nullipore, in 10 to 12 fathoms, off Silvercraigs, Loch Fyne; not uncommon (Alf. Brown). The variety *striata* (Leach), has been dredged at Tarbert Bank (Mihi).

Astarte triangularis (Montagu).—Off Silvercraigs, Loch Fyne—dead shells (Alf. Brown).

Turtonia minuta (Fabricius).—White Shore, East Loch Tarbert (B. & S.).

Lasaea rubra (Montagu).—East Loch Tarbert (B. & S.); var. *pallida*, Jeff., Loch Fyne (Alf. Brown).

Montacuta substriata (Montagu).—Off Otter, Loch Fyne (Alf. Brown). This species is frequently found on the spines of living *Spatangus purpureus*.

Montacuta bidentata (Montagu).—East Loch Tarbert (B. & S.). Off the pier at Ardrishaig—living (Alf. Brown).

Montacuta tumidula, Jeffreys.—Off Tarbert in 25 fathoms; Loch Fyne in 45 to 56 fathoms. (Somerville and J. T. Marshall in *Journal of Conchology*, vol. viii. p. 349, Jan. 1897.)

Decipula ferruginosa (Montagu).—Off the pier at Ardrishaig in rather less than 6 fathoms—fine specimens, living (Alf. Brown).

Lepton nitidum, Turton.—Off Silvercraigs, and at Otter Spit, Loch Fyne; living specimens (Alf. Brown).

Cardium echinatum, Linné.—Generally distributed, East Loch Tarbert and Loch Fyne (B. & S.). Upper Loch Fyne at Minard Narrows, and from the shore to 60 fathoms (M.). Loch Fyne (Alf. Brown).

Cardium papillosum, Poli.—Upper Loch Fyne (M.). This is an addition to Alf. Brown's Catalogue.

Cardium edule, Linné.—More common in West than in East Loch Tarbert (B. & S.). Found on shores, in bays, and in all the lochs of the Clyde district (M.). Loch Fyne (Alf. Brown).

Cardium exiguum, Gmelin.—East Loch Tarbert (B. & S.). Off Otter, Loch Fyne (Alf. Brown).

Cardium nodosum, Turton.—Has been taken in Upper Loch Fyne, on the east side and in the centre, in 30 to 70 fathoms (M.).

Cardium fasciatum, Montagu.—East Loch Tarbert (B. & S.). Upper Loch Fyne at Minard Narrows, and on east side in 10 to 30 fathoms (M.). Off Silvercraigs and off Otter, Loch Fyne (Alf. Brown).

Lævicardium norvegicum (Spengler).—East Loch Tarbert, and in Loch Fyne—single valves (B. & S.). At Minard Narrows, Upper Loch Fyne (M.).

Cyprina islandica (Linné).—Dead, but fresh, shells, near Laggan in 30 fathoms (B. & S.). At Minard Narrows; and on both sides and in the centre of Upper Loch Fyne, as well as near the head of the loch, in 5 to 65 fathoms; has also been obtained on the shore (M.).

Tapes pullastra (Montagu).—Common at White Shore, East Loch Tarbert (B. & S.). Upper Loch Fyne, on the shore—very plentiful on the Spit at Minard Narrows (M.).

Tapes virginea (Linné).—Has been observed in Upper Loch Fyne at Minard Narrows in 11 to 20 fathoms, and also at low water (M.).

Circe minima (Montagu).—Valves and dead, but fresh, shells in East Loch Tarbert and Loch Fyne (B. & S.). Upper Loch Fyne at Minard Narrows in 11 to 25 fathoms (M.). Silvercraigs, Loch Fyne (Alf. Brown).

Dosinia exoleta (Linné).—Upper Loch Fyne at Minard Narrows, also on the west side from the shore to 25 fathoms (M.).

Dosinia lincta (Pulteney).—Upper Loch Fyne, from the shore to 70 fathoms (M.).

Venus casina, Linné.—Upper Loch Fyne at Minard Narrows, in 12 to 20 fathoms, and in Lower Loch Fyne in 104 fathoms (M.). Off Silvercraigs, Loch Fyne (Alf. Brown).

Venus gallina, Linné.—Common along all the shores and in all the lochs of the Clyde district (M., Alf. Brown, and others).

Venus ovata, Pennant.—Off Battle Island, and in East Loch Tarbert (B. & S.). Common in all the Clyde lochs in depths of 10 to 70 fathoms (M.).

Venus fasciata (Da Costa).—Common in East Loch Tarbert and Loch Fyne (B. & S.). Minard Narrows, Upper Loch Fyne, in 12 to 20 fathoms (M.). Colour and sculpture variable.

Lucinopsis undata (Pennant).—Off Otter Spit, Loch Fyne; generally in about 8 to 12 fathoms (Alf. Brown).

Axinus flexuosus (Montagu). East Loch Tarbert (B. & S.). In all the upper lochs of the Clyde district in depths varying from 5 to 70 fathoms (M.).

* *Axinus ferruginosus* (Forbes).—Loch Fyne, off Tarbert, in 16 to 18 fathoms (B. & S.). Upper Loch Fyne in 10 to 35 fathoms, and in Lower Loch Fyne in 20 to 100 fathoms (M.). Alive at Moll Dhu, Loch Fyne, on a muddy bottom (Alf. Brown).

Axinus croulinensis, Jeffreys.—Lower Loch Fyne (Robertson, *Trans. Nat. Hist. Soc. of Glasgow*, vol. ii., N.S., p. 152).

Psammobia ferroënsis (Chemnitz).—At Minard Narrows, Upper Loch Fyne, in 10 to 30 fathoms, and also on the west and east sides (M.).

Solen siliqua, Linné.—East Loch Tarbert—variety *arcuata*, Jeff. (B. & S.). Large and fine specimens are occasionally obtained at extreme low water near Strachur in Upper Loch Fyne (M.).

* *Solen ensis*, Linné.—Taken in all the lochs of the Clyde district (M.).

Solen pellucidus, Pennant.—Loch Fyne, off Silvercraigs, and off Otter (Alf. Brown). Not very uncommon, but very fragile.

Mactra subtruncata (Da Costa).—Frequent in East Loch Tarbert (B. & S.). Upper Loch Fyne at Minard Narrows, in 12 to 20 fathoms, and also on the shore (M.).

Mactra elliptica, Brown.—Off the Otter Spit, Loch Fyne (Alf. Brown). Upper Loch Fyne, at Minard Narrows in 11 to 25 fathoms (M.). Jeffreys in *British Conchology* and Brown in *Mollusca of the Firth of Clyde*, include *M. elliptica*, Brown, under *M. solida*, Linné, as a variety of that species, but in Dr Norman's catalogue it is entered as a separate species.

Lutraria elliptica, Lamarck.—Upper Loch Fyne at Minard Narrows, in 12 to 20 fathoms (M.).

* *Solen siliqua* var. *arcuata* has sometimes been mistaken for *Solen ensis*; the latter, however, is usually considerably smaller than the variety *arcuata* of *S. siliqua*.

Mya arenaria, Linné.—Upper Loch Fyne, between tide marks (M.). Between tide marks East Loch Tarbert (Mihi).

Mya truncata, Linné.—East Loch Tarbert—dead shells (B. & S.). Between tide marks throughout the Clyde district where the conditions are favourable (M.).

Corbula gibba (Olivi).—Loch Fyne and East Loch Tarbert, not common (B. & S.). At Minard Narrows, and on both sides and in the centre, as well as near the head of Upper Loch Fyne, in 10 to 70 fathoms (M.). Off Silvercraigs, Loch Fyne (Alf. Brown).

Saxicavella plicata (Montagu).—A living specimen was obtained in muddy sand and nullipore at the mouth of Loch Gilp (Alf. Brown).

Saxicava rugosa (Linnaeus).—Shores of East Loch Tarbert (B. & S.). Minard Narrows, and on both sides and in the centre of Upper Loch Fyne, in 10 to 36 fathoms (M.). The variety *artica* (Linnaeus) has also been obtained at Minard (M.).

Xylophaga dorsalis, Turton.—A considerable number of specimens were obtained in a piece of partially rotten wood dredged in East Loch Tarbert; the species was also obtained under similar conditions off Skate Island, Loch Fyne (B. & S.). Also from a piece of old wood obtained off Inveraray (G.).

Teredo, sp. (?).—Specimens of a *Teredo* were observed in a piece of wood obtained on the east side of Upper Loch Fyne (M.).

Dibranchia.

Lucina borealis (Linné).—Dead shells frequent on the shore (B. & S.). On the shores of Upper Loch Fyne (M.). Off Silvercraigs, Loch Fyne (Alf. Brown).

Lucina spinifera (Montagu).—Taken on one occasion in Upper Loch Fyne, in 60 fathoms (M.). Off Otter and Moll Dhu, Loch Fyne; scarce, and not full grown (Alf. Brown).

Tellina crassa, Pennant.—One specimen off Silvercraigs, Loch Fyne (Alf. Brown). Single valves are frequent.

Tellina tenuis, Da Costa.—On the shore, Upper Loch Fyne (M.). East Loch Tarbert and neighbourhood; common (B. & S.).

Tellina fabula, Gronovius.—Off the pier at Ardrishaig (Alf. Brown).

Tellina balthica, Linné.—On the shore of Upper Loch Fyne (M.). Plentiful and fine at Lochgilphead; the variety *attenuata* (Jeff.) also occurs here (Alf. Brown).

Abra alba (S. Wood).—Off Battle Island, in muddy sand (B. & S.). In Upper Loch Fyne, on the east side and in the centre, and also near the head, in 25 to 70 fathoms (M.). Plentiful in Loch Gilp, in 5 to 7 fathoms, at the mouth of the loch (Alf. Brown).

Abra prismatica (Montague).—In muddy sand, in 6 fathoms, off Ardrishaig Pier; rather common (Alf. Brown).

Cuspidaria cuspidata (Olivi).—Off Battle Island; rare (B. & S.). At Minard Narrows, and on both sides and in the centre of Upper Loch Fyne, in 10 to 70 fathoms (M.). Loch Fyne (Robertson, see Brown's *Mollusca of the Firth of Clyde*, p. 41).

Cuspidaria costellata (Deshayes).—Tarbert Bank, Loch Fyne, and off Battle Island, in 40 fathoms (B. & S.). Minard Narrows, on the east and west sides; and off Furnace, in 10 to 25 fathoms (M.). Loch Fyne (M'Andrew, Forbes, and Barlee).

Cuspidaria abbreviata, Forbes.—In the deeper portions of Loch Fyne, rare (B. & S.). Minard Narrows, east side and centre, in 15 to 70 fathoms (M.). Loch Fyne (M'Andrew, Barlee, A. M. Norman).

Lyonsia norvegica (Chemnitz).—Loch Fyne; not common (B. & S.). Upper Loch Fyne, at Minard Narrows, and along both sides, in 8 to 20 fathoms (M.).

Cochlodesma prætenue (Pulteney).—Upper Loch Fyne, in depths of 5, 36, and 70 fathoms, as well as at low-water (M.).

Thracia papyracea (Poli).—Upper Loch Fyne, on the shore (M.).

Thracia villosiuscula (Macgillivray), variety *distorta* (Montagu).—Off Silvercraigs, Loch Fyne (Alf. Brown).

BRACHIOPODA OF LOCH FYNE.

Terebratulina caput-serpentis (Linné).—Fairly common of Battle Island, in 40 fathoms (B. & S.). At Minard, west and east sides and centre, in 10 to 65 fathoms (M.). Off Moll Dhu and Silvercraigs (Alf. Brown).

Crania anomala (O. F. Müller).—Abundant and large near Moll Dhu Point; frequent also in other parts of the loch; usually at a depth of less than 20 fathoms (B. & S.). Upper Loch Fyne, at Minard Narrows, in 11 to 20 fathoms, and towards the east side in 45 fathoms (M.).

CRUSTACEA OF LOCH FYNE.

A History of the Crustacea, by the Rev. T. R. R. Stebbing, has been followed as to the nomenclature of the MALACOSTRACA (the AMPHIPODA excepted).

BRACHYURA.

Inachus dorsettensis (Pennant).—Frequent in 10 to 20 fathoms in Loch Fyne (B. & S.). Upper Loch Fyne at Minard, and on both sides, in 10 to 30 fathoms (M.).

Hyas araneus (Linné).—Common between tide-marks (B. & S.). Upper Loch Fyne at Minard, on both sides and centre, and near the head of the loch, in 10 to 30 fathoms, and on the shore between tide-marks (M.).

Hyas coarctatus, Leach.—Common in the off-shore waters of Loch Fyne (B. & S.). Upper Loch Fyne at Minard, and on both sides, in 10 to 30 fathoms (M.).

Macropodia rostrata (Linné).—Upper Loch Fyne at Minard, and west side, in 10 to 25 fathoms (M.).

Macropodia longirostris (Fabricius).—Not common in Loch Fyne (B. & S.).

Achæus Cranchii, Leach.—Upper Loch Fyne, east side, in 10 fathoms (M.).

Cancer pagurus, Linné.—Frequent on the rocky shores of Loch Fyne (B. & S.).

Carcinus mænas (Linné).—Common (B. & S.). Both sides of Upper Loch Fyne, in 10 to 30 fathoms, and on the shore (M.). A specimen of this crab was obtained having a *Sacculina carcinī* adhering to its abdomen (G.).

Portunus puber (Linné).—Frequent in 10 to 15 fathoms or more in Loch Fyne (B. & S.). Taken in fair numbers in 1885, but not observed during 1892 (M.).

Portunus depurator (Linné).—Frequent in Loch Fyne (B. & S.). At Minard and east side of Upper Loch Fyne, in 5 to 30 fathoms; one of the commonest species of *Portunus* in the Clyde district (M.).

Portunus marmoreus, Leach.—Frequent in Loch Fyne (B. & S.).

Portunus pusillus, Leach.—Frequent in Loch Fyne (B. & S.). Upper Loch Fyne, east side, in 5 fathoms (M.).

Ebalia tuberosa (Pennant).—Tarbert Bank, Loch Fyne (Mihi).

ANOMURA.

Porcellana longicornis (Pennant).—Between tide-marks; not very plentiful (B. & S.).

Lithodes maia (Linné).—Common in Loch Fyne, but mostly of medium size (B. & S.). Vicinity of Furnace (G.). Loch Fyne (Dr Scouler *).

Eupagurus bernhardus (Linné).—Common in Loch Fyne (B. & S.). Upper Loch Fyne at Minard, on the west and east sides, and in the centre, in 10 to 70 fathoms, and also near the head of the loch (M.). ('*Pagurus ulidianus*' is a synonym of this species.)

Eupagurus Prideaux (Leach).—Common in Loch Fyne, and usually associated with *Adamsia palliata* (B. & S.). Upper Loch Fyne at Minard, on west and east sides and in the centre, in 10 to 70 fathoms (M.).

Eupagurus sculptimanus, Lucas.—Upper Loch Fyne at Minard, on the west side, in 10 to 25 fathoms (M., as *Pagurus Forbesii*). *Eupagurus Forbesii* is a synonym of *Eupagurus sculptimanus*.

* *Proceedings of Nat. Hist. Soc. of Glasgow*, First Series, vol. i. p. 8.

Eupagurus pubescens (Kroyer).—East Loch Tarbert (Mihi). Upper Loch Fyne at Minard, on the west side and in the centre, in 10 to 20 fathoms, also off Dunderave (M.). This species is usually surrounded more or less by a sponge—*Suberites suberea*.

Anapagurus Hyndmanni (Thompson).—East Loch Tarbert (Mihi).

Anapagurus laevis (Thompson).—Frequent in East Loch Tarbert and Loch Fyne (B. & S.). Upper Loch Fyne at Minard, on the west and east sides and in the centre, off Dunderave, in 10 to 36 fathoms (M.). A female with ova dredged in 105 fathoms in Loch Fyne in August (Henderson).

Anapagurus chiroacanthus, Lilljeborg (= *Eupagurus ferrugineus*, Norman).—East Loch Tarbert (B. & S.). Upper Loch Fyne, west side, in 10 to 15 fathoms (M.).

Munida rugosa (Fabricius).—Upper Loch Fyne at Minard, and on east side, in 12 to 20 fathoms (M.). Loch Fyne ; common (Dr Scouler, *op. cit.*).

Galathea squamifera, Leach.—Common in East Loch Tarbert and Loch Fyne (B. & S.). Upper Loch Fyne, west side, in 10 to 15 fathoms (M.).

Galathea nexa, Embleton.—Upper Loch Fyne at Minard, and in the centre, near the head of the loch, in 12 to 20 fathoms (M.). Loch Fyne (Dr Scouler, *op. cit.*).

Galathea dispersa, Spence Bate.—Upper Loch Fyne at Minard, and on both sides, and in the centre near the head, in 10 to 30 fathoms (M.).

Galathea intermedia, Lilljeborg.—East Loch Tarbert and Buck Bay (B. & S.). Loch Fyne at Minard, and on both sides, in 10 to 20 fathoms (M.).

MACRURA.

Calocaris Macandreae (Bell).—Occurs sparingly in the deeper portions of Loch Fyne, in 60 to 90 fathoms (B. & S.). Upper Loch Fyne, in the centre, in 60 to 65 fathoms (M.). Loch Fyne (M'Andrew). Loch Fyne, in 40 to 105 fathoms (Henderson).

Palinurus vulgaris, Latr.—A single specimen taken in herring-nets by Ardrishaig fishermen in the spring (B. & S.).

Astacus Gammarus (Linné).—The common lobster is generally distributed in Lower Loch Fyne, where the shores are rocky. There is a small summer lobster fishing carried on in Buck Bay (B. & S.). East Loch Tarbert (Mihi). The fresh-water lobster of the English rivers is not an *Astacus*, but belongs to the genus *Potamobius* of Leach (see Stebbing's *History of Crustacea*, p. 207).

Pontophilus spinosus (Leach).—Upper Loch Fyne at Minard, in 11 to 25 fathoms (M.). East Loch Tarbert ; rare (B. & S.).

Crangon vulgaris, Fabricius.—Obtained in East Loch Tarbert, but not plentiful (B. & S.). Inshore, Upper Loch Fyne (M.).

Crangon Allmani, Kinahan.—Frequent in the offshore water (B. & S.). Upper Loch Fyne, both sides and centre, and near the head, in 10 to 70 fathoms (M.). Off Inveraray (G.).

Cheraphilus echinulatus, M. Sars.—A single specimen off Skate Island, Loch Fyne, in 105 fathoms—mud (Henderson).

Cheraphilus neglectus, G. O. Sars.—Obtained occasionally in East Loch Tarbert and in neighbouring parts of Loch Fyne (Mihi).

Nika edulis, Risso.—Several specimens off Skate Island, Loch Fyne, in 105 fathoms (Henderson).

Spirontocaris Cranchii (Leach).—Loch Fyne (Forbes and M'Andrew. East Loch Tarbert (Mihi).

Spirontocaris Gaimardii (M. Edwards).—Loch Fyne (Forbes and M'Andrew), East Loch Tarbert as *Hippolyte pandaliformis* (B. & S.). Upper Loch Fyne, both sides, and in the centre, in 10 to 60 fathoms (M.).

Spirontocaris securifrons (Norman).—Common in 20 to 40 fathoms in Loch Fyne (B. & S.). Upper Loch Fyne at Minard, east side, centre, and near the head, in 10 to 70 fathoms (M.).

Hippolyte varians, Leach.—*Zostera* bed in East Loch Tarbert, abundant (B. & S.).

Hippolyte fasciger, Gosse.—East Loch Tarbert, amongst *Zostera*, frequent (Mihi).

Caridion Gordoni (Spence Bate).—Upper Loch Fyne, on both sides, in 10 to 20 fathoms (M.).

Pandalus Montagui, Leach, (= *P. annulicornis*).—Common, East Loch Tarbert and Loch Fyne (B. & S.). Abundant and of large size in Upper Loch Fyne in 70 fathoms. The species is generally found everywhere in depths greater than 40 fathoms; but is also obtained in comparatively shallow water (M.).

Pandalus brevirostris, Rathke.—East Loch Tarbert (B. & S.). West side of Upper Loch Fyne, in 10 to 15 fathoms (M.). Loch Gair and Strachur Bay (G.).

Pasiphæa sivado (Risso).—Four specimens taken off Skate Island in 105 fathoms; one measures 4 inches in length, and two others are scarcely inferior in size (Henderson). Off Strachur, in Upper Loch Fyne, in 70 fathoms (M.). A specimen of *Pasiphæa* was obtained in the large mid-water-net of the 'Garland,' at 5 fathoms below the surface, between Tarbert and Avidh Island, Loch Fyne.

SCHIZOPODA.

Euphausiidæ.

Nyctiphanes norvegica (M. Sars).—Loch Fyne; found also in the stomachs of herring and *Acanthias* (B. & S.). In great abundance in

Upper Loch Fyne just above the mud in the deepest water; also in Lower Loch Fyne, in 80 to 100 fathoms. The young are found in great profusion at all seasons of the year, in from 5 to 20 fathoms above the mud in the deepest water in Loch Fyne (M.).

Boreophausia Raschii (M. Sars).—Loch Fyne (B. & S.). Upper Loch Fyne, between Lowburn and Dunderave, taken in the bottom tow-net (G.).

Mysidæ.

Mysidopsis gibbosa, G. O. Sars.—East Loch Tarbert (B. & S.). In Barmore Bay and other parts of Loch Fyne. Head of Upper Loch Fyne (G.).

Mysidopsis didelphys (Norman).—Near the head of Loch Fyne, May 1896 (G.).

Mysidopsis augusta, G. O. Sars.—Barmore Bay, Loch Fyne, in 4 fathoms; rare (B. & S.)

Leptomysis linguara, G. O. Sars.—East Loch Tarbert; moderately frequent (B. & S.).

Leptomysis gracilis, G. O. Sars.—Between Loch Gair and Largymore, and between Lowburn and Dunderave Castle, Upper Loch Fyne (G.).

Macromysis flexuosa (O. F. Müller).—East Loch Tarbert, among *Zostera*; frequent (B. & S.). Upper Loch Fyne, inshore (M.).

**Praunus inermis* (Rathke).—East Loch Tarbert, among *Zostera* (B. & S.). Upper Loch Fyne, between Inverae and Furnace (G.).

**Praunus neglectus* (G. O. Sars).—Mouth of Loch Fyne, 60 fathoms, mud; a single specimen from a tow-net attached to the trawl (Henderson).

Hemimysis Lamornæ (R. Q. Couch).—East Loch Tarbert, among *zostera*, not very rare (B. & S.). Tarbert Bank, in 20 to 25 fathoms (G.). When alive, the species is of a bright red or scarlet colour.

Neomysis vulgaris (J. V. Thompson).—Loch Dhu, near Inveraray (J. Pringle). Prof. Bell, in *British Stalk-eyed Crustacea*, in describing this species, refers to a *Mysis* obtained by Dr Leach at Loch Ranza, Arran, and described by him as *M. integer*. The description of *M. integer* by Dr Leach is imperfect, but Prof. Bell is of the opinion that it is identical with *M. vulgaris*, J. V. Thompson. Dr Leach's record appears to be the only one for the Clyde district, hitherto—it is the only one referred to by Dr Henderson, in his *Decapod and Schizopod Crustacea of the Clyde*. It is of interest, therefore, to have this confirmation of the fact that *Mysis* (now *Neomysis*) *vulgaris* is a member of the Clyde fauna. Loch Dhu is a small brackish water loch at the mouth of the river Shira, near Inveraray, into which the tide flows and ebbs. Mr Pringle, of H.M. Ordnance Survey, who obtained the species in Loch Dhu, kindly handed his specimens over to me for examination, when I found them to belong to the *Mysis* referred to. This *Mysis* is not an uncommon species in Scotland

* See *History of Crustacea*, by the Rev. T. R. R. Stebbing, p. 227, as to the priority of *Praunus*.

—it is sometimes frequent in the Forth; I have also obtained it in Loch Wester, in Caithness; in a small loch on the Island of Barra, Outer Hebrides; and in a gathering from Loch Belmont in Shetland.

Schistomysis ornatus (G. O. Sars).—Near the head of Loch Fyne, among trawl refuse (G.).

Schistomysis arenosa (G. O. Sars).—East Loch Tarbert, among *Zostera* (B. & S.).

Siriella armata (M. Edwards).—East Loch Tarbert and neighbouring parts of Loch Fyne (B. & S.).

Siriella Brooki, Norman.—East Loch Tarbert, among *Zostera* (B. & S.). This requires careful examination to distinguish it from the next species.

Siriella Clausii (G. O. Sars).—East Loch Tarbert, among *Zostera*; a somewhat rare species (B. & S.).

Erythrops elegans (G. O. Sars).—East Loch Tarbert, and in the vicinity of Barmore, Loch Fyne (Mihi).

CUMACEA.

Iphinoë trispinosa (Goodsir).—At the head of Upper Loch Fyne, in the bottom tow-net (G.).

Vaunthompsonia cristata, Spence Bate.—East Loch Tarbert, not common (B. & S.). Off Largabruach, Upper Loch Fyne; dredged (G.).

Lamprops fasciata, G. O. Sars.—East Loch Tarbert, Loch Fyne, frequent near low water, at White Shore (B. & S.).

Hemilamprops rosea, Norman.—A single specimen of this Cumacean was taken in the bottom tow-net between Inverae and Furnace, Upper Loch Fyne (G.). In this specimen the telson was furnished with eight terminal spines.

Hemilamprops uniplicata, G. O. Sars.—East Loch Tarbert (B. & S.).

Leucon nasicus, Kroyer.—Between Lowburn and Dunderave, at the head of Upper Loch Fyne (G.).

Eudorella truncatula (Spence Bate).—Upper Loch Fyne, between Lowburn and Dunderave Castle, in the bottom tow-net (G.).

Diastylis rugosa, G. O. Sars.—East Loch Tarbert; not very common (B. & S.).

Diastylis Rathkii, Kroyer.—East Loch Tarbert; not common (Mihi).

Diastylus biplicata (Sars).—Head of Loch Fyne, in bottom tow-net (G.).

Pseudocuma cercaria, Van Beneden.—East Loch Tarbert; frequent (Mihi). Upper Loch Fyne, off Largabruach (G.).

Campylaspis costata, G. O. Sars.—Upper Loch Fyne, between Lowburn and Dunderave, in the bottom tow-net (G.).

Campylaspis rubicunda, Lilljeborg.—Upper Loch Fyne, between Lowburn and Dunderave, in the bottom tow-net (G.).

Cumella pygmæa, G. O. Sars.—East Loch Tarbert (Mihi). Tarbert Bank, Lower Loch Fyne, in 20 to 25 fathoms; and at Largabruach, Upper Loch Fyne (G.).

Nannasticus unguiculatus, Spence Bate.—Upper Loch Fyne, between Lowburn and Dunderave, ~~on~~ the bottom tow-net, and at Tarbert Bank, Lower Loch Fyne, dredged (G.).

ISOPODA.

Tanais tomentosus, Kroyer [= *T. vitatus*, (Rathke)].—Loch Fyne, near the mouth of East Loch Tarbert, on rocks which are situated between tide-mark, and more or less covered with barnacles; frequent (Mihi).

Tanaopsis laticaudatus, G. O. Sars (= **Leptognathia laticaudata*, G. O. Sars).—Moderately frequent in Loch Gair, and in dredged material collected off Largabruach, Upper Loch Fyne (G.).

Eurycopa phalangium, G. O. Sars.—This curious little Isopod was obtained in the bottom tow-net, between Lowburn and Dunderave Castle, Upper Loch Fyne; very rare (G.). I am indebted to the Rev. Mr Stebbing for the identification of this species.

Anceus maxillaris (Montagu).—Upper Loch Fyne (M.). Off Inverary (G.).

Æga bicarinata, Leach.—Dredged in Loch Fyne in 15 fathoms; bottom, mud, shells and gravel (Robertson).

Cirolana spinipes, Bate and Westwood.—Dredged at the mouth of Loch Fyne, in 37 fathoms; bottom, mud and small gravel (Robertson). Loch Fyne, in 30 fathoms (Mihi). This last was a female with ova.

Eurydice pulchra, Leach.—Upper Loch Fyne (M.). East Loch Tarbert, not unfrequent (Mihi).

Sphaeroma cursum, Leach.—East Loch Tarbert, not common (Mihi).

Limnoria lignorum (Rathke).—East Loch Tarbert, on old wood; generally distributed throughout Loch Fyne (Mihi).

Idotea tricuspidata (Desmarest).—Upper Loch Fyne, at Minard, and on the west side, in 10 to 25 fathoms (M.). East Loch Tarbert (Mihi).

Idotea pelagica Leach.—Upper Loch Fyne (M.). East Loch Tarbert, not very common (Mihi). *Idotea pelagica* is a much smaller Isopod than *I. tricuspidata*, as well as being of a different habit, and it is also proportionally stouter. I have a specimen of the former (*with ova*) not more than

* Professor Sars, in his new work on the *Crustacea of Norway* (vol. ii.), has instituted a new genus for this Isopod, viz. *Tanaopsis*.

7 mm. in length. (Notwithstanding the marked difference between ova-bearing specimens of *I. tricuspidata* and *I. pelagica*, it is now customary to consider both as belonging to the one species, viz. *Idotea marina*, Linné.)

Astacilla longicornis (Sowerby).—Upper Loch Fyne, in the centre, in 36 to 70 fathoms; also off Dunderave (M.). East Loch Tarbert (Mihi). Off Skate Island, in 105 fathoms (Robertson).

Janira maculosa, Leach.—East Loch Tarbert, under stones at low water, and dredged; generally distributed (Mihi).

Jæra (?) Nordmanni, Rathke.—Upper Loch Fyne, between Lowburn and Dunderave Castle, in a bottom tow-net gathering (G.). East Loch Tarbert (Mihi).

Leptaspidea brevipes, Bate and Westwood.—East Loch Tarbert, not common (Mihi).

Cryptothir balani (Spence Bate).—East Loch Tarbert, associated with *Balanus balanoides*. While examining a number of specimens of *Balanus balanoides* at Tarbert Laboratory, a specimen of *Cryptothir*, a female, was obtained in the sixth *Balanus* examined, but though several hundreds of the same species of *Balanus* were afterwards carefully dissected, no more *Cryptothir balani* were found (Mihi).

Athelgidae paguri (Rathke).—Occasionally obtained on *Eupagurus bernhardus* in East Loch Tarbert and neighbouring parts of Loch Fyne.

Pseudione Hyndmanni (Bate and Westwood).—This species (both the form known as “*Phryxus Hyndmanni*” and that described as “*Phryxus fusticaudatus*”),* was obtained in Loch Fyne, near Tarbert. “*Phryxus Hyndmanni*” was taken from a specimen of *Hippolyta varians*, but “*Phryxus fusticaudatus*” was obtained from a specimen of *Eupagurus bernhardus*. As regards “*Phryxus fusticaudatus*” the following note was made at the time of its discovery—“It agrees very well with the figure given in Bate and Westwood’s monograph; the clavate lobes on each side of pleon and the “spatulate” terminal segment are well developed.” (This specimen was unfortunately lost.)

AMPHIPODA.

The Amphipoda of Norway, by Professor G. O. Sars, is followed in the classification and nomenclature of this group.

Hyperiidea.

Hyperia galba (Montagu).—East Loch Tarbert, associated with *Aurelia aurita* (B. & S.).

Hyperoche tauriformis (Spence Bate).—Loch Gair, near Quay Ferry, Upper Loch Fyne (G.). These two species of the *Hyperiidea*, though

* This specimen of *Phryxus fusticaudatus* was a mature female with numerous embryo young enclosed under the ovigerous plates: these embryos closely resemble the parasitic Epicaride known as *Microniscus*, and which is found sometimes on *Calanus*.

occasionally observed within the Clyde area, are somewhat uncommon; very few specimens of either have, so far as known, been obtained in Loch Fyne. Both species are moderately common on the east coast of Scotland.

Gammaridea.

Talitrus locusta (Pallas).—Upper Loch Fyne, off Inveraray (G.).

Orchestia littorea (Montagu), [= *O. Gammarellus* (Pallas)].—East Loch Tarbert. This is a species of frequent occurrence wherever the conditions are suitable.

Hyale Lubbockiana (Spence Bate), [= *Allorchestes imbricates*, Spence Bate, and *Hyale Nelssoni*, Boeck (in part)].—East Loch Tarbert, moderately frequent.

Lysianax Costae (Milne Edwards).—Upper Loch Fyne (M.). East Loch Tarbert (Mihi).

Perrierella Audouiniana (Spence Bate), (= *Lysianassa Audouiniana*, Spence Bate, and *Pararistias Audouiniana*, Robertson).—Upper Loch Fyne, at Minard, in 11 to 25 fathoms (M.). Tarbert Bank, Lower Loch Fyne (G.).

Calisoma crenata (Spence Bate).—Loch Fyne, in 80 fathoms (Robertson). Upper Loch Fyne in the centre in 36 to 70 fathoms—inside a dead *Brissopsis lyrifera* (M.). Between Lowburn and Dunderave, rare (G.).

Hippomedon denticulatus, Spence Bate (= *Hippomedon Holbölli*, Boeck).—Loch Fyne in 80 fathoms, bottom mud (Robertson). East Loch Tarbert (Mihi). Tarbert Bank, Lower Loch Fyne, in 20 to 25 fathoms (G.).

Sophrosyne Robertsoni, Stebbing and Robertson.—(?) Upper Loch Fyne (M.).

Orchomene Batei, G. O. Sars.—Loch Fyne, in 10 to 12 fathoms (Robertson). Tarbert Bank, Loch Fyne (G.).—Upper Loch Fyne, west and east sides and centre, in 10 to 70 fathoms (M.).

**Orchomenella minuta* (Kroyer).—This species is reported from Minard, where it was obtained in 11 to 25 fathoms (M.).

Tryphosa Sarsi (Bonnier).—Upper Loch Fyne, near Largabruach, and off Inveraray (G.).

Tryphosites longipes (Spence Bate).—East Loch Tarbert (Mihi). Upper Loch Fyne (M.).

Hoplonyx cicada (Fabricius), [= *Anonyx Holbölli*, Spence Bate (not Kroyer)].—Tarbert Bank, Lower Loch Fyne, in 20 to 25 fathoms (G.).

Bathyporeia Robertsonii, Spence Bate.—East Loch Tarbert. (Prof.

*“*Orchomene propinquus*” is also recorded as having been obtained on the west side of Upper Loch Fyne, in 10 to 25 fathoms (M.). I do not find this species in Robertson's catalogue, or in Sars' monograph.

G. O. Sars seems to have no doubt as to *B. Robertsoni* being a 'good' species).

Urothoe marina, Spence Bate.—Near Barmore, Loch Fyne (Mihi). Upper Loch Fyne (M.).

Urothoe norvegica, Boeck.—Upper Loch Fyne, west and east sides and centre, in 10 to 70 fathoms (M.).

Phoxocephalus Holbölli (Kroyer).—Upper Loch Fyne, on the east side and in the centre, in 10 to 70 fathoms (M.). *Phoxus simplex*, Spence Bate, is probably synonymous with this species.

Harpinea neglecta G. O. Sars.—East Loch Tarbert (Mihi). Loch Fyne, in 80 fathoms (Robertson). Loch Gair, frequent (G.).

Ampelisca typica (Spence Bate).—East Loch Tarbert (Mihi). Upper Loch Fyne, west side, in 10 to 25 fathoms (M.).

Ampelisca laevigata, Lilljeborg.—Taken by the sieve in pure sand, at low water, at Crarae, Loch Fyne (R.). Upper Loch Fyne, in the centre, in 36 to 70 fathoms (M.).

Ampelisca tenuicornis, Lilljeborg.—Dredged in Loch Fyne, in 80 fathoms, bottom soft mud (R.). Upper Loch Fyne, at Minard, west and east sides and centre, in 10 to 70 fathoms (M.). Loch Gair (G.).

Ampelisca spinipes, Boeck.—Loch Fyne, near Skate Island, in 100 fathoms and also in 80 fathoms (R.).

Ampelisca Eschrichtii, Kroyer.—Upper Loch Fyne, at Minard, in 11 to 25 fathoms (M.).

Haploops setosa, A. Boeck.—Dredged off Skate Island, Loch Fyne, in 100 fathoms; two only were met with (Robertson).

Stegocephaloides christianiensis, Boeck.—Loch Fyne, in 40 to 70 fathoms. Upper Loch Fyne (M.).

[*Stegocephaloides aurates*, G. O. Sars, is inserted among the MS. records of the steam yacht 'Medusa' for Upper Loch Fyne, east side and centre, in 15 to 70 fathoms, but this species is not recorded in the catalogue of the late Dr Robertson.]

Amphilochus manudens, Spence Bate.—Upper Loch Fyne, between Lowburn and Dunderave, in the bottom tow-net (G.).

Cyproidea ammoniensis, Stebbing.—Upper Loch Fyne (M.).

Stenothoe marina (Spence Bate).—Upper Loch Fyne (M.). At Tarbert Bank, Lower Loch Fyne, in 20 to 25 fathoms (G.).

Stenothoe monoculodes (Montagu).—Upper Loch Fyne, west and east sides and centre, in 10 to 70 fathoms (M.).

Metopa, sp.—Upper Loch Fyne, between Lowburn and Dunderave (G.).

Cressa dubia (Spence Bate).—Tarbert Bank, Loch Fyne, dredged (G.).

Leucothoë spinicarpa (Abildgaard).—Taken in Loch Fyne, in 92 fathoms (R.). In the branchial chamber of large Ascidiants (*Ascidia mentula*) collected at low water in East Loch Tarbert; also in Ascidiants dredged on Tarbert Bank, Loch Fyne (G.).

* *Leucothoë Lilljeborgii*, Boeck.—Loch Gair, and between Lowburn and Dunderave, Upper Loch Fyne (G.).

Monoculodes carinatus, Spence Bate.—East Loch Tarbert (Mihi). Upper Loch Fyne (M.).

Monoculodes Packardi, Boeck.—Upper Loch Fyne, between Lowburn and Dunderave in the bottom tow-net (G.).

Perioculodes longimanus (Spence Bate).—Upper Loch Fyne, between Lowburn and Dunderave (G.).

Pontocrates altamarinus (Spence Bate).—Upper Loch Fyne (M.).

Synchelidium brevicarpum (Spence Bate).—Upper Loch Fyne (M.). Tarbert Bank, Lower Loch Fyne (G.).

Halimedon parvimanus (Spence Bate †).—Upper Loch Fyne, west and east sides and centre, in 10 to 70 fathoms (M.). Near Largabruach, dredged, and between Lowburn and Dunderave, in the bottom tow-net (G.). This species, which is the *Œdicerus parvimanus* of Spence Bate, is not uncommon in Loch Fyne.

Epimeria cornigera (Fabricius).—Upper Loch Fyne, at Minard, in 11 to 25 fathoms (M.).

Iphimedia obesa, Rathke.—Upper Loch Fyne, on both the west and east sides and in the centre, in 10 to 70 fathoms (M.). Near Largabruach, dredged; and in the vicinity of Carndow, near the head of the loch (G.).

Iphimedia minuta, G. O. Sars.—Upper Loch Fyne, between Lowburn and Dunderave, in the bottom tow-net; also taken with the dredge at Tarbert Bank, Lower Loch Fyne, in 20 to 25 fathoms (G.).

Eusirus longipes, Boeck.—Upper Loch Fyne, at Minard, and on the west side, in 10 to 25 fathoms (M.). Between Lowburn and Dunderave, in the bottom tow-net (G.).

Apherusa bispinosa (Spence Bate).—Upper Loch Fyne, at Minard, west and east sides and centre, in 10 to 70 fathoms (M.). Loch Gair and near Largabruach (G.).

* I have a *Leucothoë* from East Loch Tarbert (Loch Fyne) that differs from *L. Lilljeborgii* in having the penultimate as well as the last pair of epimeral plates strongly toothed at the lateral corners—the last pair having the corner tooth defined above by a sinus as in *L. Lilljeborgii*; the palm of the second gnathopode of this Tarbert specimen differs also in its general outline. This is probably the form described by Dr Robertson as *Leucothoë incisa* (see Dr Robertson's *Amphipoda of the Clyde*, Part ii., p. 23).

† See 'The Amphipoda of Bate and Westwood's "British Sessile-eyed Crustacea,"' by A. O. Walker (*Ann. and Mag. Nat. Hist.*, Sixth Series, vol. xv. p. 466, 1895).

Paratylus Swammerdami (Milne Edwards).—East Loch Tarbert (Mihi).

Paratylus vedlomensis (Spence Bate)—Upper Loch Fyne, in the middle of the loch, in 36 to 70 fathoms (M.).

Dexamine spinosa (Montagu).—Upper Loch Fyne, west and east sides and centre, in 10 to 70 fathoms (M.). Off Largabruach, dredged (G.).

Dexamine Thea, Boeck.—Upper Loch Fyne (M.). A small species, and easily overlooked.

Amathilla homari (Fabricius).—East Loch Tarbert, at extreme low water. This was one of the largest specimens I have seen (Mihi).

Gammarus marinus, Leach.—East Loch Tarbert (Mihi).

Gammarus locusta (Linné).—Upper Loch Fyne, at Minard, in 11 to 25 fathoms (M.). Off Inveraray (G.). East Loch Tarbert (Mihi).

Melita obtusata (Montagu).—Upper Loch Fyne, west side, in 10 to 25 fathoms (M.). Off Inveraray, and near Carndow at the head of the loch (G.).

Mæra Othonis (Milne Edwards).—Upper Loch Fyne, at Minard, on the west and east sides and in the centre, in 10 to 70 fathoms (M.). Loch Fyne in 90 fathoms [Robertson, as *Mæra longimana* (Thompson)]. Tarbert Bank, Loch Fyne, dredged (G.). *Mæra longimana* (Thompson) is considered to be the male of *M. Othonis*, but Spence Bate's figure of the hand of the second gnathopods of *Mæra (Megamæra) longimana* is quite different from that of Sars' figure of the hand of the same gnathopods of the male of *Mæra Othonis*.

Cheirocrates Sundewalli (Rathke).—Upper Loch Fyne, at Minard Narrows and in the centre of the loch, in 11 to 70 fathoms (M.). Dredged near Largabruach, and also at Tarbert Bank (G.).

Cheirocrates intermedius, G. O. Sars.—Dredged in Loch Gair in Upper Loch Fyne, rare (G.). East Loch Tarbert, 1886 (Mihi).

Cheirocrates assimilis (Lilljeborg).—Lower Loch Fyne, in 104 fathoms (Robertson). Tarbert Bank, in 20 to 25 fathoms (G.).

Microdeutopus anomalus (Rathke).—Upper Loch Fyne, on the east side, in 15 to 30 fathoms (M.). East Loch Tarbert (Mihi).

Microdeutopus danmoniensis (Spence Bate).—Upper Loch Fyne, at Minard, on the east side and in the centre, in 11 to 70 fathoms (M.). According to Sars this is the *Microdeutopus gryllotalpa* of Spence Bate, but not of Costa.

Aora gracilis (Spence Bate).—Loch Gair, Upper Loch Fyne, dredged; not common (G.).

Leptocheirus pilosus, Zaddach.—Tarbert Bank, Lower Loch Fyne, in 20 to 25 fathoms (G.). The antennal appendages are two-jointed in these Tarbert Bank specimens.

Gammaropsis erythrophthalma, Lilljeborg.—Upper Loch Fyne, at Minard, on the east side and in the centre, in 11 to 70 fathoms (M.).

Podoceropsis Sophieæ, Boeck.—Upper Loch Fyne, at Minard, west and east sides, in 10 to 30 fathoms (M.).

Podoceropsis excavata (Spence Bate).—Upper Loch Fyne (M.).

Amphithoe rubricata (Montagu).—Upper Loch Fyne (M.). East Loch Tarbert (Mihi).

Pleonexes gammarodes, Spence Bate.—East Loch Tarbert, at low-water, and dredged (Mihi).

Podocerus pusillus, G. O. Sars.—Tarbert Bank, Loch Fyne, dredged (G.).

Erichthonius abditus (Templeton).—Upper Loch Fyne, on the east side, in 15 to 30 fathoms (M.). East Loch Tarbert, both ♂ and ♀ (Mihi). Loch Gair (G.).

Corophium Bonellii, Milne Edwards.—Off Inveraray, Loch Fyne, also near Carndow, and in Loch Gair (G.).

Corophium crassicornis, Bruzelius.—East Loch Tarbert (Mihi).

Dulichia falcata (Spence Bate).—Tarbert Bank, Lower Loch Fyne (G.).

CAPRELLIDEA.

Phtisica marina, Slabber.—Upper Loch Fyne (M.). Between Lowburn and Dunderave, and off Ardno (G.). East Loch Tarbert (Mihi). Tarbert Bank, in 20 to 25 fathoms (G.).

Pariambus typicus (Kroyer).—East Loch Tarbert, on the common starfish (*Asterias rubens*) (Mihi).

Caprella linearis (Linné).—East Loch Tarbert, amongst *Zostera* (Mihi).

Caprella acanthifera, Leach.—East Loch Tarbert, amongst *Zostera* (Mihi).

PHYLLOCARIDA (PHYLLOPODA).

Nebalia bipes, Milne Edwards.—Upper Loch Fyne, off Inveraray, and off Largabruach (G.). East Loch Tarbert (Mihi).

CLADOCERA.

Evadne Nordmanni, Lovén.—Upper Loch Fyne, between Carndow and Dunderave, off Inveraray and off Furnace (G.). A generally distributed species, but sometimes it may occur in abundance; at other times it may be very scarce.

Podon polyphemoides, Leuckart.—Near the head of Loch Fyne; this species was found in considerable abundance about 12 inches or so below the surface of the water.

(?) *Podon intermedius*, Lilljeborg.—Upper Loch Fyne.

OSTRACODA.

PODOCOPA.

Paracypris polita, G. O. Sars.—Loch Fyne, off Tarbert, rare (Norman).

Pontocypris mytiloides, Norman.—East Loch Tarbert; not uncommon (B. & S.).

Pontocypris trigonella, G. O. Sars.—East Loch Tarbert (B. & S.).
Loch Gair, and off Inveraray; not uncommon (G.).

Argillaecia cylindrica, G. O. Sars.—Off Tarbert, Loch Fyne, in 25 fathoms (Norman).

Bairdia complanata, G. S. Brady.—Loch Fyne (Norman).

Cythere lutea, Müller.—East Loch Tarbert (B. & S.). A moderately common species, especially in shallow water.

Cythere confusa, Brady and Norman.—East Loch Tarbert (B. & S.).
Loch Gair, Upper Loch Fyne (G.). Generally distributed throughout the district.

Cythere porcellanea, G. S. Brady.—Off Inveraray, Upper Loch Fyne (G.).

Cythere (?) semipunctata, G. S. Brady.—Off Tarbert, Loch Fyne (Norman). Loch Fyne (Mihi).

Cythere crispata, G. S. Brady.—East Loch Tarbert (B. & S.).

Cythere gibbosa (Brady and Robertson).—Loch Gilp (Loch Fyne) (Brady and Robertson).

Cythere albo-maculata, Baird.—East Loch Tarbert (B. & S.). Generally distributed.

Cythere Robertoni, G. S. Brady.—Loch Fyne, off East Loch Tarbert (Mihi). Not very uncommon.

Cythere convexa, Baird.—East Loch Tarbert (B. & S.). A moderately common species.

Cythere marginata, Norman.—Off Tarbert, Loch Fyne, in 25 fathoms (A. M. Norman).

Cythere cluthæ, Brady, Crosskey, and Robertson.—Loch Fyne, in 20 fathoms (Mihi—see *Monograph of the Marine and Fresh-Water Ostracoda of the North Atlantic and North-Western Europe*, Part i. p. 145).

Cythere villosa (G. O. Sars).—Off Inveraray (G.). East Loch Tarbert (B. & S.). Common and generally distributed.

Cythere tuberculata (G. O. Sars).—East Loch Tarbert (B. & S.).

Cythere concinna, Rupert Jones.—Dredged in Loch Fyne (Brady and Robertson). East Loch Tarbert (B. & S.).

Cythere angulata (G. O. Sars).—Off Tarbert Loch Fyne (A. M. Norman). East Loch Tarbert (B. & S.).

Cythere antiquata (Baird).—East Loch Tarbert (B. & S.).

Cythere Jonesii (Baird).—Loch Fyne, off Tarbert, in 25 fathoms, and off Skipness in 41 fathoms (A. M. Norman). Loch Fyne (B. & S.).

Cytheridea papillosa, Bosquet.—Loch Fyne (B. & S.). More or less generally distributed.

Cytheridea punctillata, Brady.—Loch Fyne, off Inveraray, off Tarbert, and off Skipness (A. M. Norman). Loch Fyne (B. & S.). Upper Loch Fyne (G.).

Cytheridea (?) subflavescens, G. S. Brady.—Loch Fyne, in 40 fathoms ; off Skipness, off Tarbert, in 25 fathoms (A. M. Norman). Loch Fyne (G. S. Brady and D. Robertson).

Eucythere declivis (Norman) = *Eucythere argus* (G. O. Sars).—Loch Fyne (B. & S.). A moderately common species.

Krithe bartonensis (Jones).—Loch Fyne, off Inveraray and off Tarbert, in 25 fathoms (A. M. Norman). Off Inveraray, and between Carndow and Ardno, north side of the loch (G.).

Loxoconcha impressa (Baird).—East Loch Tarbert (B. & S.). Loch Gair and off Largabruach (G.). A moderately common species.

Loxoconcha guttata (Norman).—Loch Fyne, at Inveraray, and off Skipness (A. M. Norman).

Loxoconcha multifora (Norman).—East Loch Tarbert (B. & S.). Loch Fyne, as *Cythere multifora* (A. M. Norman).

Loxoconcha tamarindus (Jones).—East Loch Tarbert (B. & S.). Moderately common everywhere.

Xestoleberis aurantia (Baird).—East Loch Tarbert (B. & S.). Not very rare in Loch Fyne.

Xestoleberis depressa (G. O. Sars).—Loch Fyne (Mihi). Loch Gair and off Inveraray (G.).

Cytherura gibba (Müller).—East Loch Tarbert (B. & S.).

Cytherura cornuta (G. S. Brady).—East Loch Tarbert (B. & S.). Off Inveraray, Upper Loch Fyne (A. M. Norman). Loch Fyne (G. S. Brady and D. Robertson).

Cytherura sella, G. O. Sars.—East Loch Tarbert, as *Cy. flavesrens* (B. & S.). A moderately common species throughout the district.

Cytherura acuticostata, G. O. Sars.—Loch Fyne (A. M. Norman).

Cytherura striata, G. O. Sars.—East Loch Tarbert (B. & S.). A common and generally distributed species.

Cytherura angulata (G. S. Brady).—East Loch Tarbert (B. & S.).

Cytherura undata, G. O. Sars.—East Loch Tarbert (B. & S.). This is a small species and easily overlooked.

Cytherura producta, G. O. Brady.—Loch Fyne, off Tarbert, in 25 fathoms (A. M. Norman).

Cytherura nigrescens (Baird).—East Loch Tarbert (B. & S.). There is scarcely a haul made inshore with the dredge in which this species does not occur.

Cytherura similis, G. O. Sars.—Loch Fyne, off Skipness (A. M. Norman). Generally distributed throughout the Clyde area.

Cytherura cellulosa, Norman.—East Loch Tarbert (B. & S.). This is a very small species and easily overlooked.

Cytheropteron latissimum (Norman).—East Loch Tarbert (B. & S.).
Loch Fyne (A. M. Norman).

Cytheropteron nodosum, G. S. Brady.—East Loch Tarbert (B. & S.).
Loch Fyne, off Tarbert (A. M. Norman).

Cytheropteron inflatum, Brady, Crosskey, and Robertson.—Loch Fyne (A. M. Norman). This is the only British record for *Cytheropteron inflatum* as a recent species.

Cytheropteron punctatum, G. S. Brady.—Loch Fyne, off Tarbert, in 25 fathoms (A. M. Norman). East Loch Tarbert (Mihi).

Cytheropteron alatum, G. O. Sars.—Loch Fyne, off Tarbert, in 25 fathoms (A. M. Norman). East Loch Tarbert, as *Cytheropteron arcuatum* (B. & S.).

Cytheropteron angulatum, Brady and Robertson.—East Coast Tarbert (B. & S.). Loch Fyne, off Tarbert, in 25 fathoms (A. M. Norman).

Cytheropteron humile, Brady and Norman.—Off Inveraray, Upper Loch Fyne (G.). Hitherto this Ostracod has almost invariably been obtained from pieces of partially decayed wood brought up in the dredge or trawl—wood that has been more or less perforated by boring Mollusks or Crustacea. In such situations I have usually found this Ostracod associated with the Copepod *Laophonte simulans*, T. Scott.

Bythocythere constricta, G. O. Sars.—Loch Fyne (G. S. Brady and D. Robertson).

Bythocythere turgida, G. O. Sars.—Furlong Bay, Loch Fyne (B. & S.).

Bythocythere simplex (Norman).—East Loch Tarbert (B. & S.). This is a moderately common species in Loch Fyne and in the Clyde generally.

Pseudocythere caudata, G. O. Sars.—Loch Fyne (B. & S.). This Ostracod is not very rare, but is easily overlooked.

Sclerochilus contortus (Norman).—Loch Fyne (B. & S.). A moderately common and widely distributed species.

Paradoxostoma variable (Baird).—East Loch Tarbert, Loch Fyne (B. & S.). A common and generally distributed species.

Paradoxostoma pulchellum, G. O. Sars.—Furlong Bay, Loch Fyne (B. & S.).

Paradoxostoma Hodgei, G. S. Brady.—Off Tarbert, Loch Fyne, in 25 fathoms (A. M. Norman).

Paradoxostoma flexuosum, G. S. Brady.—Loch Fyne, off Inveraray, in 25 to 40 fathoms, and also off Skipness (A. M. Norman).

Paradoxostoma affine, T. Scott.—Off Inveraray, Upper Loch Fyne, in 25 to 40 fathoms (A. M. Norman).

Machærina tenuissima (Norman).—Loch Fyne as *Xiphichilus tenuissima* (B. & S.).

MYODOCOPA.

Asterope mariæ (Baird).—East Loch Tarbert (B. & S.). Off Tarbert, Loch Fyne (A. M. Norman). Off Largabruach, Upper Loch Fyne (G.).

Asterope teres (Norman).—East Loch Tarbert (B. & S.). This species is much less common in Loch Fyne than the previous one.

Philomedes interpuncta (Baird).—East Loch Tarbert (B. & S.). Off Largabruach, Upper Loch Fyne (G.).

CLADOCOPA.

Polycope orbicularis, G. O. Sars.—East Loch Tarbert (B. & S.). Loch Fyne (Brady and Norman).

Polycope punctata, G. O. Sars.—Some specimens dredged in Loch Fyne are doubtfully referable to this species (Brady and Norman).

THE COPEPODA OF LOCH FYNE.

In the preparation of this list, *The Monograph of the British Copepoda*, by Prof. G. S. Brady; *The Copepoda of the Bay of Naples*, by Dr Giesbrecht; Dr Canu's Monograph *Les Copepodes de Boulonnais*, besides many separate papers, have been consulted.

GNATHOSTOMATA.

Calans finmarchicus (Gunner).—Very abundant in Upper Loch Fyne in deep water, where they are found all the year through; less abundant towards the lower end of the loch.

Pseudocalanus elongatus, Boeck.—Generally distributed, and more or less frequent all over the loch. The following are a few of the localities where the species has been obtained: In surface and bottom tow-nets at the head of Loch Fyne, off Inveraray in a tow-net at 3 fathoms from the surface; in surface and bottom tow-nets, between Loch Gair and Largymore; and in surface tow-net between Tarbert and Avidh Island (G.).

~~x see Dr W.~~
~~Giesbrecht's~~
~~Notes in~~
x see Dr W.
Giesbrecht's
Notes in

x Bradypidius (Brady).

(?) *Pseudocalanus armatus*, Boeck.—In bottom tow-net gatherings from the vicinity of Largymore and Furnace, and between Lowburn and Dunderave Castle (G.).

Stephos gyrans (Giesbrecht).—(Pl. II. fig. 9; Pl. III. figs. 17, 18). A single specimen—a female—of this interesting species was obtained in some dredged material from Loch Gair, Upper Loch Fyne. A careful comparison of the various appendages of this Loch Gair specimen with Dr Giesbrecht's description and figures, leaves no doubt as to its identity with the specimens obtained at Naples. Dr Giesbrecht discovered his specimens in the tanks of the Zoological Station at Naples. The species appears to be quite distinct from *Stephos minor* (T. Scott) from the Firth of Forth. The Loch Gair specimen measures .8 mm. in length (about $\frac{1}{30}$ th of an inch).

Euchaeta norvegica, Boeck.—Common in the deep water of Upper Loch Fyne, and also obtained occasionally at the surface (G.). Upper Loch Fyne in 60 to 70 fathoms; taken at all seasons of the year in great abundance in Upper Loch Fyne, at from 5 to 15 fathoms above the mud in the deepest water. The females seem to carry a succession of ova, which are of a bluish colour, all through the year (M.).

Scolopithrix hibernica, A. Scott.*—Taken in a bottom tow-net gathering between Carndow and Dunderave Castle, and between Loch Gair and Minard Castle (G.). This species was first obtained in deep water off the coast of county Down, Ireland, by my son, Mr Andrew Scott.

Centropages typicus, Kröyer.—East Loch Tarbert and neighbouring parts of Loch Fyne (Calderwood).

Centropages hamatus (Lilljeborg).—East Loch Tarbert and Loch Fyne (Calderwood). Off Inveraray, between Carndow and Dunderave Castle, and in Loch Gair (G.). This species is moderately common all over the district; Loch Fyne (M.).

Temora longicornis (Müller).—This also is a moderately common and widely distributed species. It has been obtained off Garndow, off Inveraray, off Minard, and in Loch Gair (G.). In East Loch Tarbert and Loch Fyne (Calderwood).

Metridia hibernica (Brady and Robertson).—East Loch Tarbert and Loch Fyne (Calderwood). Off Largabruach, Upper Loch Fyne (G.). Dr W. Giesbrecht gives the following synonymy for this species.†

* Ann. and Mag. Nat. Hist., Nov. 1896, p. 362, Pls. XVII. and XVIII.

† Pelagischen Copepoden des Golfs von Neapel, p. 340.

Metridia hibernica (Brady and Robertson).

1873 *Paracalanus hibernicus*, Brady and Robertson (*Ann. and Mag. Nat. Hist.*, S. 4, vol. xii. p. 126, Pl. VIII. figs. 1-3).

1878 *Metridia armata*, Brady (*Mon. Brit. Copep.*, vol. i. p. 42). (not *Metridia armata*, Boeck.)

1887 ? *Pleuromma armatum*, Pouchet and de Guerne (*Compt. Rend. Acad. Paris*, T. 104, pp. 712-715).

Anomalocera Patersonii, Templeton.—East Loch Tarbert and Loch Fyne (Calderwood). This copepod is at times moderately common in Lower Loch Fyne.

Parapontella brevicornis (Lubbock). East Loch Tarbert and Loch Fyne (Calderwood).

Acartia Clausii, Giesbrecht.—Head of Loch Fyne, between Carndow and Ardno. Off Inveraray, and in the vicinity of Minard (G.). Upper Loch Fyne, in 30 to 70 fathoms, as *Dias longiremis* (M.). ? East Loch Tarbert as *Dias longiremis* (Calderwood). I have examined specimens of *Acartia* from various parts of Upper and Lower Loch Fyne, and *A. Clausii* is the only species that has yet been observed in this part of the Clyde area.

Paramisophria, nov. gen.—Somewhat like *Misophria* in general appearance. Antennules short, and composed of about twenty-one joints. Antennæ, with the primary branch short, three-jointed; secondary branches longer than the primary, and two-jointed; mouth organs as in the *Calanidae*. Swimming feet nearly as in *Pseudocyclops*; both branches three-jointed. Each part of the fifth pair consists of a more or less simple two-jointed branch.

This genus, though apparently a true member of the family *Misophriidae*, differs from the two genera *Misophria* and *Pseudocyclops*, most closely allied to it, in the structure of the antennæ and of the fifth pair of thoracic feet.

Paramisophria cluthæ, nov. spec. (Pl. II., figs. 3-8; Pl. III., figs. 13-16). Description of the female—length, 1·4 mm. ($\frac{1}{18}$ th of an inch). Body, robust; abdomen, short; only about one-fourth of the length of the cephalothorax (fig. 13, Pl. III.). Antennules short; twenty-one jointed; joints very short (fig. 14, Pl. III.). The formula shows approximately the proportionate lengths of all the joints:—

$$\begin{array}{cccccccccccccccccc} 14 & \cdot & 5 & \cdot & 4 & \cdot & 2 & \cdot & 3 & \cdot & 4 & \cdot & 4 & \cdot & 6 & \cdot & 8 & \cdot & 9 & \cdot & 6 & \cdot & 6 & \cdot & 11 \\ 1 & \cdot & 2 & \cdot & 3 & \cdot & 4 & \cdot & 5 & \cdot & 6 & \cdot & 7 & \cdot & 8 & \cdot & 9 & \cdot & 10 & \cdot & 11 & \cdot & 12 & \cdot & 13 & \cdot & 14 & \cdot & 15 & \cdot & 16 & \cdot & 17 & \cdot & 18 & \cdot & 19 & \cdot & 20 & \cdot & 21 \end{array}$$

Antennæ short, three-jointed, end joint small; secondary branches considerably longer than the primary branches, and composed of two elongate sub-equal joints (fig. 3, Pl. III.). Anterior foot-jaws four-jointed, stout, the second and last joints short; the first and second joints, with a few small papilliform and setiferous appendages on the inner aspect; the end joint is furnished with a number of long plumose setæ (fig. 4, Pl. II.). Posterior foot-jaws elongate, moderately stout, (?) seven-jointed, first two joints large and sub-equal, the third, fifth, and sixth small, and of nearly equal length, fourth joint about one and a half times the length of the preceding joint, the (?) seventh is very minute; the three last are strongly

setiferous (fig. 5, Pl. II.). Swimming feet are somewhat like those of *Pseudocyclops*, both branches are three-jointed and furnished with numerous plumose setæ on the inner margins; in the first pair the marginal spines are slender (fig. 6, Pl. II.). In the fourth pair the spines are short, stout, and sabre-like (fig. 7, Pl. II.). The fifth pair consists each of a single two-jointed branch, the first joint is short, but produced interiorly at the distal end into a cylindrical process about as long, and half as broad as the joint itself, and provided at the apex with a small spine and an elongate plumose seta; second joint sub-cylindrical, and fully three times the length of the first joint, and armed with five stout spines, arranged along the outer margin and apex (fig. 8, Pl. II.). Abdomen composed of four segments, the last two being together scarcely equal in length to the preceding segment; caudal stylets rather longer than the entire length of the last two abdominal segments (fig. 16, Pl. III.). Male unknown.
Habitat—Off Largabruach, Upper Loch Fyne; dredged.

Misophria pallida, Boeck.—Dredged near Largabruach, Upper Loch Fyne (G.).

Thorellia brunnea, Boeck.—Head of Loch Fyne between Carndow and Ardno; off Largabruach and Loch Gair, Upper Loch Fyne (G.). This is not an uncommon copepod in the Clyde in dredged material.

Cyclopina littoralis, G. S. Brady.—In the vicinity of Carndow, near the head of Upper Loch Fyne; and also near Largabruach; in dredged material (G.).

Cyclopina gracilis, Claus.—This species has been obtained in Loch Gair; and also off Inveraray, Upper Loch Fyne (G.).

Oithona (?) similis, Claus.—East Loch Tarbert and Loch Fyne (Calderwood). Off Inveraray; and between Carndow and Ardno (G.). Upper Loch Fyne, in 30 to 70 fathoms (M.).

Notodelphys Allmani, Thorell.—East Loch Tarbert, and Tarbert Bank, Loch Fyne, in 20 to 25 fathoms; in branchial chamber of large Ascidiants (Mihi).

Notodelphys agilis, Thorell.—Also found in the branchial chamber of large Ascidiants collected at extreme low-water in East Loch Tarbert.

Notodelphys prasina, Thorell.—With the others in the branchial chamber of large Ascidiants (Mihi). This species has short caudal stylets.

Doropygus porcicauda, Brady.—A copepod, belonging apparently to this species, was obtained in the branchial chamber of Ascidiants from East Loch Tarbert, and also from Largabruach, Upper Loch Fyne (G.). Though slightly imperfect, the Largabruach specimen resembles this, and no other described British species.

Botachus cylindratus, Thorell.—Obtained in the branchial chamber of Ascidiants collected in East Loch Tarbert.

Notopterophorus papilio, Hesse.—This curious copepod was of frequent occurrence in the branchial chamber of large Ascidiants from East Loch Tarbert (Mihi).

Ascidicola rosea, Thorell.—Upper Loch Fyne, between Carndow and Ardno ; from an Ascidian brought up in the trawl-net (G.).

Longipedia coronata, Claus.—Loch Gair, and off Largabruach, Upper Loch Fyne ; in dredged material (G.).

Longipedia minor, T. and A. Scott.—In material dredged off Largabruach, Upper Loch Fyne (G.). This is not much more than half the size of the other ; both forms were obtained off Largabruach, and specimens of both carried ova.

Ectinosoma Sarsi, Boeck (*E. spinipes*, Brady).—In material dredged off Largabruach, Upper Loch Fyne (G.).

Ectinosoma melaniceps, Brady.—Head of Upper Loch Fyne, between Carndow and Ardno, and off Inveraray (G.).

Ectinosoma atlanticum, Brady and Robertson.—Upper Loch Fyne, in 30 to 64 fathoms (M.). Common in a tow-net gathering from Upper Loch Fyne. Collected by the late Mr Brook.

Ectinosoma curticorne, Boeck.—Dredged off Largabruach, Upper Loch Fyne ; rare (G.).

Ectinosoma Herdmani, T. & A. Scott.—Dredged off Largabruach and in Loch Gair, Upper Loch Fyne (G.).

Ectinosoma pygmæum, T. & A. Scott.—Dredged at Tarbert Bank, Lower Loch Fyne, in 20 to 25 fathoms (G.).

Bradya elegans, T. and A. Scott.—Loch Gair, and near Largabruach, Upper Loch Fyne ; dredged (G.).

Bradya similis, T. and A. Scott.—Upper Loch Fyne, near Largabruach, in dredged material (G.).

Zosima typica, Boeck.—In dredged material from Largabruach, Upper Loch Fyne (G.).

Amymone sphærica, Claus.—East Loch Tarbert and Loch Fyne (Calderwood).

Stenhelia hispida G. S. Brady.—In material dredged in Loch Gair and near Largabruach (G.). This distinct and fine species was not very uncommon in the Largabruach gathering. In the spirit specimens, the last abdominal segment and caudal stylets were usually of a more or less dusky hue.

Stenhelia ima (G. S. Brady).—East Loch Tarbert, Loch Fyne (Mihi)(?), off Inveraray (G.).

Ameira longiremis, T. Scott.—Dredged in Loch Gair, Upper Loch Fyne (G.).

Ameira longicaudata, T. Scott.—This well marked species was obtained near the head of Upper Loch Fyne (G.).

Jonesiella spinulosa (Brady and Robertson).—Near Largabruach, Upper Loch Fyne, in dredged material (G.). *Jonesiella fusiformis*, which in some localities appears to be a more common species than the one recorded here, has not yet been observed in any of the collections made by the ‘Garland’ in the Clyde.

Delavalia robusta (Brady and Robertson).—Near Largabruach, Upper Loch Fyne, in dredged material; not very rare (G.).

Delavalia mimica, sp. n. (Pl. I. figs. 1–9.).

Description of the Female..—Length, .65 mm. ($\frac{1}{13}$ th of an inch). Body moderately stout, and somewhat like *Delavalia reflexa* in general appearance. Antennules eight-jointed, the penultimate joint is smaller than any of the others, while the last is rather more elongate than either of the preceding three or four joints (fig. 2). The antennæ and mouth organs are somewhat similar to those of *D. reflexa*; the principal seta of the end joint of the mandible-palp is moderately stout and curved, and of considerable length (fig. 3). The inner branches of the first pair of swimming feet are three-jointed, the first joint is rather longer than the entire length of the three-jointed outer branches, but the second and third are short, and together scarcely equal to half the length of the first joint (fig. 5). The second, third, and fourth pairs do not differ much from those of other species of *Delavalia* (fig. 6 shows the fourth pair). The fifth pair, which have a general resemblance to those of other species of *Delavalia*, differ in the following points: the armature of the basal joint consists of three moderately short and rather stout spines, situated on the apex of the slightly produced inner portion, in addition to two spiniform setæ, one of which is exterior and the other interior to the spines; the innermost of the three spines, which is also the largest, bears two minute marginal hairs near its extremity—one on either side. The secondary joint is lamelliform, moderately broad, and subcylindrical. The margins, which, in the middle of the joint are somewhat parallel, converge towards both ends, and the distal end, which for this reason assumes a triangular form, is provided with five setæ and a short stout spine; this spine is situated at the beginning of the exterior distal slope, while the five setæ are arranged, two on each sloping distal margin, and one at the apex, as shown in the drawing (fig. 7).

Description of the Male..—The male differs little from the female except in the form and armature of the fifth pair of feet. The basal joint of the fifth pair bears interiorly a single, and somewhat peculiar, stout, and moderately large spine, and a small spiniform seta; the secondary joint is small, subovate, and armed with three spines on the oblique distal end of the exterior margin; there is also a seta at the apex and another on the inner margin, as shown by the drawing (fig. 8). The second pair in the male were not modified, as is sometimes the case, but resembled those of the female.

Habitat..—Loch Gair, Upper Loch Fyne. It has also been obtained in other parts of the Clyde district, and in the Firth of Forth at Granton.

Remarks..—This species differs very markedly from any other *Delavalia* known to me in the structure of the first pair of swimming feet; this pair are not very unlike those of some species of *Dactylopus* or *Ameira*; but as the structure of the mandibles and of the fifth pair of feet is that of

a true *Delaralia*, I prefer for the present to give this Loch Gair form a place in the genus to which it has so close an affinity.

Pontopolites typicus, T. Scott.—In dredged material from Loch Gair and from near Largabruach, Upper Loch Fyne (G.).

Diosaccus tenuicornis (Claus).—East Loch Tarbert (Mihi). A moderately large and well marked species.

Laophonte horrida (Norman).—East Loch Tarbert and Loch Fyne (Calderwood). Loch Gair, Largabruach, and near the head of Upper Loch Fyne (G.).

Laophonte thoracica, Boeck.—East Loch Tarbert (Mihi). Near Largabruach and off Inveraray, Upper Loch Fyne (G.).

Laophonte hispida (Brady and Robertson). Loch Gair, and near Largabruach Upper Loch Fyne, in dredged material (G.).

Laophonte simulans, T. Scott.—Off Inveraray. Several specimens from a piece of partially decayed wood brought up in the trawl-net (G.). This was associated with *Cytheropteron humile* (B. & N.).

Laophonte similis (Claus).—Taken in East Loch Tarbert and in Loch Fyne (Calderwood).

Laophonte lamellifera (Claus).—Also taken in East Loch Tarbert and Loch Fyne (Calderwood).

Laophonte serrata (Claus).—East Loch Tarbert (Mihi). This is quite a distinct and comparatively large species, and it is also one of the rarest species of the genus.

Laophonte depressa, T. Scott.—Loch Fyne, off Tarbert, in 20 to 25 fathoms, in dredged material.

Normanella dubia (Brady and Robertson).—Obtained in dredged material from Loch Gair and from near Largabruach (G.).

Cylindropsyllus laevis, G. S. Brady.—From pools between tide-marks in East Loch Tarbert.

Cletodes longicaudata (Brady and Robertson).—East Loch Tarbert, Largabruach, and Loch Gair, in dredged material (G.).

Cletodes linearis (Claus).—This somewhat rare species was obtained in material dredged in East Loch Tarbert, Loch Fyne.

Cletodes curvirostris, T. Scott.—In dredged material from Loch Gair and Largabruach (G.).

Itunella tenuiremis (T. Scott). = [Cletodes tenuiremis, T. Scott,* and Itunella (?) subsalsa, G. S. Brady†].—Dredged near Largabruach, Upper

* Eleventh Annual Report of the Fishery Board for Scotland, Part iii. p. 204, pl. iii., figs. 21–28.

† Nat. Hist. Trans. of Northumb., Durham, and Newcastle-upon-Tyne, vol. xiii. p. 6, pl. i. Separate reprint.

Loch Fyne (G.). This copepod, when first described, was doubtfully referred to the genus *Cletodes* for reasons stated in the 'remarks' on the species. Sometime afterwards Dr Brady instituted the genus *Itunella* for what appears to be a closely allied form from the Solway. Having, during the last two or three years, examined many specimens of *Cletodes tenuiremis* from different localities, I now quite agree with Dr Brady in considering this copepod to be generically distinct from *Cletodes*, and have, therefore, adopted his generic appellation.

Enhydrosoma curvatum (Brady and Robertson).—This species was obtained in dredged material from Loch Gair and from near Largabruach (G.).

Dactylopus tisboides, Claus.—Loch Fyne and East Loch Tarbert (Calderwood). Dredged near Largabruach (G.).

Dactylopus similis, Claus.—East Loch Tarbert (Mihi). Near the head of Loch Fyne (G.). This is a distinct and moderately large species; it does not appear to be common in the Loch Fyne district.

Dactylopus flavus, Claus.—Obtained by the 'Garland' near the head of Loch Fyne.

Dactylopus stromii (Baird).—East Loch Tarbert, Loch Fyne, in dredged material (Mihi).

Thalestris Clausii, Norman.—Loch Fyne and East Loch Tarbert (Calderwood). Dredged near Largabruach (G.).

Thalestris mysis, Claus.—This fine species has been recorded from East Loch Tarbert by Mr Calderwood. I also have found it there.

Thalestris longimana, Claus.—Loch Fyne and East Loch Tarbert (Calderwood). This is one of the more common and widely distributed species of *Thalestris*.

Thalestris forficuloides, T. and A. Scott.—Obtained off Inveraray and near Largabruach (G.).

Westwoodia nobilis (Baird).—Loch Fyne and East Loch Tarbert (Calderwood).

Harpacticus chelifer (Müller).—East Loch Tarbert (Calderwood). Near Largabruach and near the head of Upper Loch Fyne (G.).

Zaus spinatus, Goodsir.—Loch Fyne and East Loch Tarbert (Calderwood).

Alteutha depressa, Baird.—Loch Fyne and East Loch Tarbert (Calderwood, as *Peltidium depressum*). This copepod may usually be obtained where *Laminaria* is more or less common—as in the bays, where the water is shallow.

Alteutha interrupta (Goodsir).—Loch Fyne and East Loch Tarbert (Calderwood as *Peltidium interruptum*).

Peltidium purpureum, Philippi.—East Loch Tarbert (Mihi). (See a

description of the species by Dr Brady in the *Fifth Annual Report of the Fishery Board for Scotland.*) Near Largabruach, Upper Loch Fyne (G.).

Porcellidium fimbriatum, Claus.—Loch Fyne and East Loch Tarbert (Calderwood). Upper Loch Fyne, near Largabruach, and near the head of the loch (G.).

Porcellidium subrotundum, Norman.—Upper Loch Fyne, in 30 fathoms (M.).

Idya furcata (Baird).—East Loch Tarbert (Calderwood). Upper Loch Fyne, near Largabruach, and off Inveraray (G.).

Idya longicornis, T. and A. Scott.—East Loch Tarbert, Loch Fyne (Mihi). This is a large and well-marked species.

Idya gracilis, T. Scott.—This was obtained in Loch Gair, off Inveraray, and near the head of Loch Fyne (G.).

Idya minor, T. and A. Scott.—Upper Loch Fyne, near Largabruach, and near the head of the loch (G.).

Scutellidium fasciatum (Boeck).—East Loch Tarbert (Calderwood). Obtained by washing the 'roots' of *Laminaria* and other large marine algæ.

Monstrilla (?) Danæ, Claparède.—A single representative of this curious group of Copepods was obtained in a bottom tow-net gathering collected between Dunderave and Ardno, near the head of Loch Fyne (G.). The specimen is a female, and has three abdominal segments. The first segment is about twice as long as the second, and is more tumid; it is also rather longer than the third segment; it bears two long 'genital setæ,' which are united at the base so as to form a very short but quite distinct basal part; the caudal setæ are three on each furca. The antennules are in length scarcely equal to one-third the length of the body; the first joint is about four and a half times the length of the second, the third is about one and a half times the length of the second, and the second and fourth joints are nearly equal in length; the antennules are four-jointed. The Loch Fyne specimen thus agrees very well with the brief description of *Monstrilla Danæ*, Claparède, in Mr Bourne's memoir on the *Monstrillidae*.* The fifth feet, so far as I can make them out without dissection, resemble those of *Monstrilla gracilicauda*, Giesbrecht.

PARASITA.

Lichomolgus fuciculus, G. S. Brady.—Upper Loch Fyne, near Largabruach, in dredged material (G.).

Lichomolgus forficulus, Thorell.—In the branchial chamber of large Ascidians from Loch Fyne and East Loch Tarbert (Mihi).

Lichomolgus furcillatus, Thorell.—Off Inveraray, Upper Loch Fyne, from trawl refuse (G.).

* *The Quarterly Journal of Microscopical Science*, vol. xxx. (new series), p. 575 (February 1890). Reprint.

(?) *Lichomolgus maximus*, I. C. Thompson.—Obtained in specimens of the common *Pecten*—*Pecten opercularis*—from Loch Gair, off Inveraray, and from near the head of the loch (G.). This is not a true *Lichomolgus*, and is only provisionally placed here.

Pseudanthessius liber (Brady and Robertson).—This species is from the same localities as the last (G.).

† *Dermatomyzon nigripes* (Brady and Robertson).—This fine species has been obtained in East Loch Tarbert (Calderwood); and near the head of Upper Loch Fyne (G.).

Artotrogus orbicularis, Boeck.—A single ♂ and ♀ specimen of this fine species were taken in material dredged at Tarbert Bank, Loch Fyne, in 20 to 25 fathoms (G.).

† *Bradyponius magniceps* (G. S. Brady).—Has been recorded for East Loch Tarbert (Calderwood); it has also been obtained near the head of Upper Loch Fyne among trawl refuse (G.).

Bradyponius Normani (B. and R.) (Pl. II. figs. 1 and 2; Pl. III. figs. 1–11).

Description of the female.—Length of the specimen figured, 1·5 mm. ($\frac{1}{16}$ of an inch). In general appearance somewhat like *Bradyponius magniceps*, G. S. Brady, but the abdomen is more elongate and slender (fig. 1, Pl. III.). Antennules short and nine-jointed; the first joint is of moderate length, the third is fully three times the length of the preceding joint; the next five joints are small, while the last is nearly twice the size of the penultimate joint (fig. 3, Pl. III.). The formula shows approximately the proportionate lengths of the joints.

Proportionate lengths of the joints,	13 · 5 · 17 · 7 · 5 · 6 · 5 · 7 · 13.
Number of the joints,	1 · 2 · 3 · 4 · 5 · 6 · 7 · 8 · 9.

The antennæ are somewhat like those of *Asterocheres Boecki*, G. S. Brady; the secondary branch is small and uniarticulate, and bears a single apical seta (fig. 5, Pl. III.). The mandibles are elongate and very slender (fig. 6, Pl. III.). The maxillæ consist of two small branches, as shown by the figure (fig. 7, Pl. III.). Both foot-jaws are robust and strongly clawed (figs. 8 and 9, Pl. III.). The swimming feet, which are robust, have the inner margins of both branches furnished with numerous plumose setæ (figs. 1 and 2, Pl. II.). The secondary joint of the fifth pair is small and sub-quadrangular, and furnished with three setæ; a single seta also springs from the basal joint (fig. 10, Pl. III.). The abdomen is composed of four segments—genital segment larger than the others.

Description of the male.—The male differs slightly in its general outline from the female; the abdomen is five-jointed, and the genital segment is rather larger than the others. The antennules are ten-jointed; the first six are nearly as in the female; the seventh joint is about equal to the combined lengths of the three preceding joints; the eighth, ninth, and last are each rather smaller than the one that immediately precedes it; the antennæ are hinged and adapted for grasping (fig. 4, Pl. III.). The other appendages resemble those of the female.

† See Dr Giesbrecht on the family *Ascomyzontidae*, Thorell. (*Zoologischen Anzeiger*, Nos. 521, 522, 1897.)

Habitat.—Loch Gair, Upper Loch Fyne.

Remarks.—Living specimens of this handsome species are very prettily ornamented with usually eight brick-red blotches, six of which are submarginal; and two central—one being at the anterior apex of the first body segment and one near the posterior portion of the thorax, as shown by figs. 1 and 2, Pl. III., which are reproduced from drawings of a living male and female specimen from Cromarty Firth. The markings on the cephalothoracic segment were similar in all the specimens examined, but one or other of the posterior marginal blotches were observed to be occasionally absent. The general colour of the dorsal surface was yellowish, tinged with brown. When examined under the microscope, the integument was also seen to be thickly besprinkled with minute circular markings. The secondary branches were quite distinct, though small. With the exception of the antennules, the various appendages were the same in the male as in the female.

†*Scotomyzon gibberum* (T. and A. Scott).—From specimens of the common star-fish (*Asterias rubens*) caught near the head of Loch Fyne (G.).

Caligus rapax, Milne Edwards.—East Loch Tarbert, on a coal-fish caught in Loch Fyne (Mihi).

Caligus diaphanus, Nordmann (with numerous specimens of *Udonella caligororum* adhering to the *Caligus*). From large Coalfish caught in Loch Fyne (Mihi).

Lepeophtheirus pectoralis (Müller).—From the pectoral fins of plaice (*Pleuronectes Platessa*), caught off Inveraray and in Ard-a-Eaolas Bay (G.).

Lernentoma cornuta (Müller).—Taken from the gills of long rough dabs (*Hippoglossoides limandoides*), caught off Inveraray (G.).

Lernentoma lophii (Johnston). From an Angler fish caught in Loch Fyne (Mihi).

Anchorella uncinata (Müller).—Found adhering to the inside of the mouth and on the gills of a young coal-fish caught in Loch Gair, Upper Loch Fyne (G.).

CIRRIPEDIA.

Balanus porcatus, Da Costa.—Upper Loch Fyne, at Minard, attached to *Mytilus* (M.).

Balanus Hameri, Ascanius.—Upper Loch Fyne, at Minard and on the west side, in 12 to 20 fathoms; also on the shore (M.).

Balanus balanoides (Linné).—Upper Loch Fyne, at Minard and on the west side, in 12 to 20 fathoms; also on the shore (M.).

Balanus crenatus (Brug.).—At Minard and on both sides of Upper Loch Fyne, in 10 to 20 fathoms, and between tide-marks (M.).

Verruca Strömia, O. F. Müller.—Off Inveraray, Upper Loch Fyne, in 4 to 10 fathoms (M.).

† See Dr Giesbrecht on the family *Ascomyzontidae*, Thorell. (*Zoologischen Anzeiger*, Nos. 521, 522, 1897.)

Sacculina carcini (Thompson).—Parasitic on a specimen of *Carcinus mænas*, captured in the trawl-net near the head of Upper Loch Fyne (G.).

Peltogaster paguri (Rathke).—Parasitic on *Eupagurus*, East Loch Tarbert (Mihi).

POLYZOA OF LOCH FYNE.

The following list of Loch Fyne Polyzoa is compiled entirely from the MS. records of the steam-yacht 'Medusa.' The arrangement is that of the British Association *Report on the Marine Zoology, Botany, and Geology of the Irish Sea* (1896).

CHEILOSTOMATA.

Gemellaria loricata (Linné).—Upper Loch Fyne, at Minard Narrows, in 10 to 15 fathoms (M.).

Bugula turbinata, Alder.—Upper Loch Fyne, east side in 10 to 20 fathoms (M.).

Cellaria fistulosa (Linné).—Upper Loch Fyne, at Minard and at east side, in 10 to 20 fathoms (M.).

Membranipora pilosa (Linné).—Upper Loch Fyne, east side, in 15 fathoms (M.).

Membranipora Flemingii, Burk.—Upper Loch Fyne, at Minard, in 10 to 15 fathoms (M.).

Microporella impressa (Audouin).—Upper Loch Fyne, at Minard, in 10 to 20 fathoms (M.).

Schizoporella unicornis.—Upper Loch Fyne, at Minard and east side, in 10 to 30 fathoms (M.).

Hippothoa distans, MacGillivray (*Hippothoa flagellum* (Manzoni), (Hincks).—Upper Loch Fyne, at Minard, in 15 fathoms (M.).

Leprailia Pallasiana (Moll).—Upper Loch Fyne, at Minard (M.).

Leprailia cruenta, Norman.—Minard, Upper Loch Fyne (M.).

Porella compressa (Sowerby).—Upper Loch Fyne, east side, in 10 to 20 fathoms (M.).

Smittia reticulata (MacGillivray).—Upper Loch Fyne (M.).

Cellepora pumicosa (Linné).—Upper Loch Fyne, at Minard and east side, in 15 to 20 fathoms (M.).

Cellepora ramulosa (Linné).—East side of Upper Loch Fyne, in 15 to 20 fathoms (M.).

Cellepora avicularis, Hincks.—East side of Upper Loch Fyne, in 15 to 20 fathoms (M.).

CYCLOSTOMATA.

Crisia eburnea (Linné).—At Minard, Upper Loch Fyne, in 15 to 20 fathoms (M.).

Crisia denticulata (Lamarck).—Upper Loch Fyne, at Minard and east side, in 15 to 20 fathoms (M.).

Diastopora obelia (Johnston).—Upper Loch Fyne, east side, in 15 to 20 fathoms (M.).

Stomatopora granulata (Milne Edwards).—Upper Loch Fyne, at Minard (M.).

Lichenopora hispida (Fleming).—At Minard, Upper Loch Fyne, in 15 to 20 fathoms (M.).

CTENOSTOMATA.

Vesicularia spinosa (Linné).—Upper Loch Fyne, east side, in about 15 fathoms (M.).

Incerta sedis.

Escaroides rosacea.—Upper Loch Fyne, at Minard (M.).

(ARACHNIDA.)

(One or two species of *Pycnogon*s and *Acarina* have been observed in Loch Gair and in other parts of Loch Fyne, but these have not yet been identified.)

THE VERMES OF LOCH FYNE.

CHÆTOPODA.

The following records have almost all been obtained from the MS. notes of the steam yacht 'Medusa.'

Tomopteris onisciformis, Eschscholtz.—Obtained in a surface tow-net gathering collected in Lower Loch Fyne by the Fishery steamer 'Garland.'

Filigrana implexa, Berkeley.—Upper Loch Fyne, near Minard, in 15 to 20 fathoms (M.).

Spirorbis borealis, Mörch.—Upper Loch Fyne, between tide-marks (M.).

Serpula triquetra (Linné).—At Minard, and on both sides and in the centre of Upper Loch Fyne, in 10 to 36 fathoms, and also between tide-marks (M.).

Serpula vermicularis (Ellis).—At Minard, and on both sides and in the centre of Upper Loch Fyne, in 10 to 36 fathoms (M.).

Serpula contortuplicata (Linné).—On the east side of Upper Loch Fyne, in 15 to 30 fathoms; and at Minard, in 11 to 25 fathoms (M.).

Dasychone argus.—This somewhat rare species was obtained on the east side of Upper Loch Fyne (M.).

Sabella pavonia (Savigny).—Taken in Upper Loch Fyne, on both sides and in the centre, in 10 to 70 fathoms (M.).

Sabella penicillus (Linné).—Taken in deep water, in the centre of Upper Loch Fyne and also near the head of the loch (M.).

Sabella, sp.—A form of *Sabella* that has not been identified was obtained on the west side of Upper Loch Fyne, in 10 to 25 fathoms (M.).

Polycirrus aurantiacus, Malmgren.—This annelide was obtained in the centre of Upper Loch Fyne, in 35 fathoms (M.).

Polymnia nasidensis, Chiaje.—Taken in Upper Loch Fyne, in 15 to 20 fathoms (M.).

Polymnia nebulosa.—This *Polymnia* was obtained in the same locality as the last, and it also occurred on the east side of Upper Loch Fyne (M.).

Notomastus, sp.—An annelide apparently belonging to this genus was obtained on the east side of Upper Loch Fyne (M.).

Thelepus circinatus, Fabricius.—Taken in 15 to 20 fathoms, in Upper Loch Fyne.

Terebella, sp.—A species of annelid was obtained in Upper Loch Fyne, in 15 to 20 fathoms, and also at Minard, that apparently belonged to this genus (M.).

Terebellides Stroemii, Sars.—Taken in Upper Loch Fyne, in 15 to 20 fathoms (M.).

Trophonia glauca, Malmgren.—This was obtained in the same locality as the last.

Pectenaria belgica (Pallas).—*Pectenaria* was taken at various depths from between tide-marks to the deep water in the centre of the loch ; and also in various localities from near the head of the loch downwards (M.). It has also been obtained in East Loch Tarbert in Lower Loch Fyne.

Maldane biceps, Sars.—This was taken in Upper Loch Fyne, in the centre of the Loch in 60 fathoms (M.).

Rhodine Lovéni.—This, like a few of the others, appears to be a deep-water form ; it occurred in the centre of the Loch in 70 fathoms (M.).

Clymene (Paxilla) gracilis.—This was obtained in Upper Loch Fyne, in 15 to 20 fathoms (M.).

Clymene amphistoma.—This also was procured in Upper Loch Fyne, in 15 to 20 fathoms (M.).

Cirratulus, sp.—A species of *Cirratulus* was obtained on the west side

of Upper Loch Fyne, in 10 to 15 fathoms, and also between tide-marks (M.).

Arenicola piscatorum, Lamarck.—This was obtained between tide-marks in Upper Loch Fyne (M.).

Chætopterus variopedatus, Ren. [= *Chæt. insignis* (Baird)].*—Taken at Minard, and on both sides of Upper Loch Fyne, in 10 to 20 fathoms (M.).

Eumenia Jeffreysii.—Taken on the east side and in the centre of Upper Loch Fyne, in 20 to 70 fathoms, and also near the head of the Loch (M.).

Ammotrypane aulogaster, Rathke.—Upper Loch Fyne, in 15 to 20 fathoms (M.). In East Loch Tarbert, Lower Loch Fyne, dredged (Mihi).

Glycera tesselata, Grube; variety *Macintoshii*.—This was taken in Upper Loch Fyne, at various depths from 15 to 20 fathoms, down to 60 fathoms in the centre of the Loch (M.).

Laetmonice filicornis, Kinberg, variety *Kinbergi*, was obtained in 70 fathoms in the centre of Upper Loch Fyne; it also occurred on both sides of the Loch (M.).

Neomenia carinata.—This also was obtained in the centre of the loch in 70 fathoms (M.).

Eunice norvegica (Linne).—*Eunice norvegica* was procured on the east side of Upper Loch Fyne (M.).

Eunice, sp.—A species of this genus was obtained in 10 to 15 fathoms, in Upper Loch Fyne, but was not identified (M.).

Hyalinæcea tubicola (Müller).—This species, which appears to be widely distributed, was obtained at Minard, and also in the centre of the Loch, in 15 to 70 fathoms (M.).

[*Nothria tubicola* ((?)) = *Hyalinæcea tubicola*) was obtained in somewhat similar localities as the last.]

Lumbriconereis nardonis, Grube.—Occurred on the east side of Upper Loch Fyne (M.).

Nereis Dumerilii (Aud. and M. Edw.) was obtained on the east side of Upper Loch Fyne in 10 to 15 fathoms (M.).

Nereis pelagica (Linné).—Taken at Minard, in the centre of Upper Loch Fyne, near the head, and also between tide-marks (M.). In east Loch Tarbert and neighbouring parts of Lower Loch Fyne.

Nereis, sp.—An unidentified species of *Nereis* was obtained at Minard, in the centre of the Loch, near the head, in 12 to 70 fathoms, and also between tide-marks (M.).

Nephthys Hombergi (Aud. and M. Edw.) was procured in Upper Loch Fyne, on the east side (M.).

* See J. Hornell, in *Tenth Annual Report of the L.M.B.C.*, p. 28 (1897).

Nephthys ciliata.—This form was obtained in Upper Loch Fyne, in 15 to 20 fathoms (M.).

Lepidonotus squamatus (Linné) was found on the east side of Upper Loch Fyne.

Halosydna gelatinosa, Sars.—This was taken on the east side of Upper Loch Fyne, and on the shore at low water (M.).

Polynoe squamata (Johnston).—At Minard; on both sides of Upper Loch Fyne, in 10 to 30 fathoms; and between tide-marks (M.).

Polynoe, sp.—A species of *Polynoë*, not identified, was obtained at Minard; and on both sides, as well as in the centre and near the head of the Loch, in 10 to 35 fathoms; it was also found on the shore between tide-marks (M.).

Aphrodite aculeata (Linné).—At Minard; and on the east side and in the centre of Upper Loch Fyne, in 15 to 70 fathoms, as well as near the head of the Loch (M.). East Loch Tarbert and adjacent parts of Lower Loch Fyne, not rare.

Hermione hystrix Savigny (= *Aphrodite hystrix*).—This species appears to be more restricted in its distribution than the last, and confined to deeper water; it was obtained in Upper Loch Fyne, in the deep water of the centre—65 to 70 fathoms (M.).

GEPHYREA.

Sipunculus bernhardus was obtained at Minard, in about 10 fathoms (M.).

(?) *Phascolosoma strombi* (Mont.).—A species of *Sipunculus*, which was probably a *Phascolosoma*, was obtained at Minard, and also in the centre of the Loch in depths ranging from 10 to 70 fathoms, in the dead shells of *Dentalium* (M.).

CHÄTOGNATHA.

Sagitta bipunctata, Quoy and Gaimard, appeared to be generally distributed all over the Loch.

NEMERTEA.

Lineus marinus (Mont.) is occasionally obtained at the roots of tangle and other sea-weeds, specimens many yards in length being sometimes observed.

TURBELLARIA.

Planaria, sp.—Specimens of a *Planaria* (probably *Planaria littoralis*) are occasionally observed in Loch Fyne; but the *Planarians*, as well as the other groups of *Vermes*, require further study; and when that is done considerable additions will no doubt be made to the preceding list.

THE ECHINODERMATA OF LOCH FYNE.

The Catalogue of the British Echinoderms in the British Museum, by Prof. Jeffrey Bell, is followed as to the arrangement and names in this list.

CRINOIDEA.

Antedon bifida (Pennant).—Common near the east shore of Loch Fyne (B. & S.).

ASTEROIDEA.

Porania pulvillus (O. F. Müller).—In Upper Loch Fyne at Minard in 11 to 25 fathoms (M.).

Stichaster roseus (O. F. Müller).—Taken at Minard, west side, in 10 to 25 fathoms, also on the shore at low water (M.) East Loch Tarbert (B. & S.).

Solaster papposus (Fabricius).—Minard, on both sides, in 10 to 30 fathoms, and also on the shore (M.). Frequent in Loch Fyne, smaller specimens between tide marks (B. & S.). Strachur Bay (G.).

Solaster endeca (Linné). At Minard, on both sides, in 10 to 25 fathoms (M.). Frequent some distance from shore, and also occurs at low water (B. & S.).

Henricia sanguinolenta (O. F. Müller).—On both sides of Loch Fyne, at Minard, in 10 to 40 fathoms (M.). East Loch Tarbert (B. & S.).

Asterias glacialis, Linné.—On the west side of Upper Loch Fyne, in 10 to 25 fathoms (M.). Frequent in 20 to 30 fathoms in Loch Fyne, sometimes of large size (B. & S.).

Asterias rubens, Linné.—Generally distributed, and more or less frequent all over the loch, and at all depths ; Minard, etc. (M.). East Loch Tarbert (B. & S.). Cairndow, Loch Gair, etc. (G.).

Asterias Murrayi, Bell.—Upper Loch Fyne, in 65 fathoms. (F. Jeffrey Bell, in *Catalogue of the Brit. Echin. in the British Museum*, p. 103, Pl. XII., figs. 1 and 2).

OPHIUROIDEA.

Ophiura ciliaris (Linné).—Frequent in East Loch Tarbert (B. & S.). Generally distributed in Upper Loch Fyne, in from 10 to 70 fathoms (M.).

Ophiura albida, Forbes.—Loch Fyne and East Loch Tarbert, common (B. & S.). Generally distributed in Upper Loch Fyne, in from 10 to 70 fathoms (M.).

Ophiura affinis, Lütken.—On both sides, and in the centre of Upper Loch Fyne, at Minard, in from 12 to 70 fathoms (M.).

Amphiura Chiajii, Forbes.—Off Inveraray (Robertson, in *Trans. N. H. S. Glasg.*, vol. i.). On both sides and centre of Upper Loch Fyne, and also near the head, in 15 to 70 fathoms (M.).

Amphiura filiformis (O. F. Müller). Off Buck Island, Loch Fyne (B. & S.). Both sides and centre of Upper Loch Fyne, in 10 to 70 fathoms (M.).

Amphiura elegans (Leach).—Frequent between tide-marks (B. & S.).

Ophiopholis aculeata (Linné).—Generally distributed, and more or less frequent in Loch Fyne, Upper and Lower (M., B. & S., G.).

Ophiocoma nigra (Abilgard).—Very abundant, in 15 to 20 fathoms (B. & S.). At Minard, Upper Loch Fyne, on both sides, in 10 to 30 fathoms (M.). Abundant in Loch Gair (G.).

Ophiothrix fragilis (Abilgard).—Common, especially near the east shore of Loch Fyne (B. & S.) Upper Loch Fyne, on both sides, in from 10 to 30 fathoms, and also between tide-marks (M.).

ECHINOIDEA.

Echinus miliaris, Linné.—Between tide marks, East Loch Tarbert (B. & S.). Upper Loch Fyne, at Minard, on both sides and in the centre, in from 10 to 60 fathoms, and also between tide-marks (M.). Strachur Bay, Loch Gair, etc. (G.).

Echinus esculentus, Linné.—More or less common all over the loch, both upper and lower, usually on hard ground.

Spatangus purpureus (O. F. Müller).—Upper Loch Fyne, at Minard, and in the centre of the loch, in 12 to 70 fathoms (M.).

Echinocardium cordatum (Pennant).—A moderately common species in Loch Fyne, where the conditions are suitable, as in East Loch Tarbert (B. & S.). At Minard (M.), and Cairndow (G.).

Brissopsis lyrifera, Forbes.—In the centre of Upper Loch Fyne, in 55 to 60 fathoms (M.). Tarbert Bank, Lower Loch Fyne (Mihi).

HOLOTHURIOIDEA.

Synapta digitata (Montagu).—Loch Fyne (Dr Scouler in *Trans. N. H. S. Glasg.*, vol. i. p. 8).

Cucumaria Hyndmani (Thompson).—Obtained on the east side of Upper Loch Fyne, in 20 fathoms (M.).

Cucumaria pentactes (?) (Linné).—Upper Loch Fyne, on the east side, in about 20 fathoms (M.).

Thyone fusus (O. F. Müller).—On the west side of Upper Loch Fyne, in from 10 to 15 fathoms (M.).

Thyone raphanus, Dub. and Kor.—East Loch Tarbert (Mihi). East side of Upper Loch Fyne, in about 20 fathoms (M.).

Psolus phantapus (Strassenfeldt).—Upper Loch Fyne, at Minard, and on the east side of the loch, in 11 to 25 fathoms (M.).

Doubtful species.

Cribella aculeata.—Said to have been found on the shore of Upper Loch Fyne (M.).

Ophiocoma minuta.—Reported from Minard, Upper Loch Fyne (M.).

Ophioactis Ballii (Thomp.)?—*Zostera* bed, East Loch Tarbert (B. & S.).

THE ACTINOZOA OF LOCH FYNE.

ALCYONARIA.

Alcyonium digitatum (Linné).—Upper Loch Fyne, at Minard, on both sides, in 10 to 25 fathoms, and also on the shore.

Sarcodictyon catenata, Forbes.—Upper Loch Fyne, in the centre near the head (M.).

Virgularia mirabilis (Linné).—Upper Loch Fyne, at Minard, and in the centre of the loch, in 11 to 70 fathoms.

ACTINIARIA.

Bolocera Tuediae (Johnston).—Loch Fyne, off Tarbert; taken occasionally in the dredge (Mihi). In deep water between Penmore and Inveraray (G.). This is a large species with the tentacle scarcely retractile; it is of a red colour, and appears to be confined to moderately deep water. At Minard, and in the centre of the loch, in 15 to 70 fathoms (M.).

Anemonia sulcata, Pennant [*Anthea cereus* (Ellis and Solander)].—Frequent on the leaves of *Zostera* in East Loch Tarbert, at extreme low water (Mihi).

Adamsia palliata (Bohadsch.).—Minard, on both sides, and in the centre of the loch, in 10 to 70 fathoms (M.). Usually found adhering to the univalve shells inhabited by *Eupagurus Prideauxii*.

Actinia equina, Linné [*A. mesembryanthemum* (Ellis and Solander)].—Common between tide marks.

Tealia crassicornis (Müller).—Frequent between tide marks among stones, and usually with small gravel adhering to the test.

Stomphia Churchiae, Gosse.—Upper Loch Fyne, at Minard, on the east and west side, and in the centre, in 12 to 36 fathoms (M.).

Edwardsia callimorpha (Gosse).—Taken in Upper Loch Fyne, on the east side, in 10 to 12 fathoms (M.).

Edwardsia carnea (Gosse).—Port Loy, at low water, attached to stones (M.).

Caryophyllia Smithii (Stokes).—Loch Fyne; rare (Mihi).

HYDROZOA OF LOCH FYNE.

The species recorded below were nearly all obtained by the steam-yacht 'Medusa'; their names are arranged in accordance with Hincks' *British Hydroid Zoophytes*.

Hydractinia echinata (Fleming).—Upper Loch Fyne, at Minard, on both sides, and in the centre, in 12 to 20 fathoms (M.).

Endendrium rameum (Pallas).—Upper Loch Fyne, in the centre (M.).

Campanularia verticillata (Linné).—Upper Loch Fyne (M.). A moderately common species in deep water.

Lafoëa dumosa (Fleming).—At Minard and east side of Upper Loch Fyne, in 12 to 20 fathoms (M.).

Lafoëa fruticosa (M. Sars). At Minard, Upper Loch Fyne, in 12 to 20 fathoms (M.).

Halecium muricatum (Ellis and Solander).—At Minard, Upper Loch Fyne, in 15 to 20 fathoms (M.).

Sertularella rugosa (Linné).—At Minard, Upper Loch Fyne, in 12 to 20 fathoms (M.). The stem of *S. rugosa*, which may be found adhering to the fronds of *Laminaria* or *Flustra*, sends out more or less numerous and crowded shoots, scarcely an inch in height.

Sertularella fusiformis (Hincks).—On the east side of Upper Loch Fyne, in 15 fathoms (M.). This is a small species, measuring from a quarter of an inch to an inch in height.

Diphasia fallax (Johnston).—Loch Fyne (A. M. Norman, see *British Hydroid Zoophytes*, p. 251).

Sertularia pumila, Linné.—Upper Loch Fyne, between tide-marks (M.).

Sertularia filicula, Ellis and Solander.—Upper Loch Fyne, at Minard, in 17 to 25 fathoms (M.). This is one of the less common of the *Sertulariae*.

Sertularia abietina, Linné.—At Minard, Upper Loch Fyne, in 12 to 20 fathoms (M.). A moderately common species.

Sertularia argentea, Ellis and Solander.—Upper Loch Fyne, in moderately deep water (M.). In this species the shoots extend to a foot or more in height.

Aglaophenia myriophyllum (Linné).—Loch Fyne (A. M. Norman,—see *British Hydroid Zoophytes*, p. 292).

SPONGOZOA.

Grantia compressa, Fleming.—Between tide-marks, Upper Loch Fyne (M.). East Loch Tarbert (Mihi).

Grantia ciliata, Fleming.—Upper Loch Fyne, east side, in 12 to 20 fathoms (M.).

Halichondria albescens, Johnston.—East and west sides of Upper Loch Fyne, and also between tide-marks.

Halichondria panicea (Pallas), variety *papillaris*.—East side of Upper Loch Fyne, and also between tide-marks (M.).

Suberites domuncula, Olivi.—Loch Fyne, in 48 fathoms; found by Mr Pearcy (M.). (?) (*Hymeniacidon suberea*, of Bowerbank, is a synonym of this).

Suberites ficus (Johnston).—At Minard Narrows, Upper Loch Fyne, in 15 to 20 fathoms.

Halisarca Dujardinii, Johnston.—Upper Loch Fyne, on *Inachus dorsettensis*, in 55 fathoms; found by Mr Pearcy (M.).

FORAMINIFERA OF LOCH FYNE.

MILIOLIDÆ.

Biloculina ringens (Lamarck).—Loch Fyne, in dredged materials (B. & S.).

Biloculina depressa, D'Orbigny.—East Loch Tarbert (B. & S.).

Biloculina elongata, D'Orbigny.—Loch Fyne (Mihi).

Spiroloculina limbata, D'Orbigny. } Loch Fyne, in dredged material
Spiroloculina canaliculata, D'Orbigny. } (B. & S.).

Miliolina trigonula, Lamarck. } Loch Fyne, in dredged material
Miliolina tricarinata, D'Orbigny. } (B. & S.).

Miliolina seminulum, Linneé. }
Miliolina subrotunda, Montague. } Dredged in East Loch Tarbert
Miliolina secans (D'Orbigny). } (B. & S.). *M. seminulum*
Miliolina Ferussacii (D'Orbigny). } and *M. subrotunda*, also off
Miliolina agglutinans (D'Orbigny). } Inveraray (G.).

Miliolina contorta (D'Orbigny).—Dredged, Tarbert Bank, Loch Fyne, in 20 to 25 fathoms (Mihi).

Cornuspira foliacea (Philippi).—Dredged in East Loch Tarbert (B. & S.).

ASTRORHIZIDÆ.

Astrorhiza limicola, Sand.—Tarbert Bank, Loch Fyne, in 20 to 25 fathoms; dredged (Mihi).

LIT^UHOLIDÆ.

Reophax scorpiurus, Montfort.

Haplophragmium canariense (D'Orbigny).

Haplophragmium pseudospirale (Williamson).

Ammodiscus gordialis, Parker and Jones.

Trochamina squamata (Parker and Jones).

} Dredged at Tarbert Bank, Loch Fyne, in 20 to 30 fathoms (Mihi).

TEXTULARIIDÆ.

Textularia sagittula, Defrance.—East Loch Tarbert (B. & S.).

Textularia pygmaea, D'Orbigny.—Dredged in Loch Fyne, at Tarbert Bank, in 20 fathoms (Mihi).

Bulimina marginata, D'Orbigny.—Dredged in East Loch Tarbert (B. & S.).

LAGENIDÆ.

Lagena sulcata (Walker and Jacobs).—Dredged in East Loch Tarbert (B. & S.).

Lagena laevis (Montague).

Lagenal gracillima, Sagz.

Lagena globosa (Montague).

Lagena striata (D'Orbigny).

} Dredged in Loch Fyne, at Tarbert Bank, in 20 to 25 fathoms (B. & S.).

Lagena marginata (Walker and Jacobs).—Dredged in East Loch Tarbert (B. & S.).

Lagena melo (D'Orbigny).—Dredged in Loch Fyne (B. & S.).

Lagena squamosa (Montague).—Dredged in East Loch Tarbert (B. & S.).

Lagena hexagona (Williamson).—Loch Fyne, at Tarbert Bank (B. & S.).

Lagena Jeffreysii, Brady.—Dredged in Loch Fyne and East Loch Tarbert (B. & S.).

Nodosaria scalaris (Lamarck).—Not uncommon in Loch Fyne (B. & S.).

Nodosaria (Dentalina) communis (D'Orbigny).—Loch Fyne (B. & S.).

Cristellaria rotulata (Lamarck).

Cristellaria crepidula (Fichtel and Moll).

} Dredged at Tarbert Bank, Loch Fyne (Mihi).

Polymorphina lactea (Walker and Jacobs).—East Loch Tarbert; a moderately common species (B. & S.)

<i>Polymorphina tubulosa</i> (D'Orbigny).	These three species were obtained with the dredge in Loch Fyne, at Tarbert Bank, in 20 to 25 fathoms (Mihi).
<i>Polymorphina gibba</i> , D'Orbigny.	
<i>Polymorphina rotundata</i> , Born.	

GLOLIGERINIDÆ.

Orbulina universa, D'Orbigny.—East Loch Tarbert (B. & S.).

ROTALIIDÆ.

Patellina corrugata, Williamson.—Loch Fyne (B. & S.).

Discorbina rosacea (D'Orbigny).—East Loch Tarbert (B. & S.).

Discorbina globularis (D'Orbigny).—Loch Fyne, at Tarbert Bank, in 20 to 25 fathoms (Mihi).

Plunorbulina mediterranensis, D'Orbigny.—East Loch Tarbert (B. & S.).

Truncatulina lobatula (Walker and Jacobs).

Rotalia Beccarii (Linné).

Rotalia nitida (Williamson).

Gypsina inhærens, Schultze.—Loch Fyne; rare (Mihi).

NUNMULINIDÆ.

Nonionina asterizans.

Nonionina depressula.

East Loch Tarbert, usually in dredged material; common (B. & S.).

Operculina ammoides, Gronovius.—Tarbert Bank, Loch Fyne, dredged in 20 to 25 fathoms (Mihi).

Polystomella crispa (Linné).

Polystomella striato-punctata (Fichtel and Moll).

East Loch Tarbert; common (B. & S.).

APPENDIX TO THE FAUNA OF LOCH FYNE.

Several more or less interesting marine organisms have recently been obtained within the Clyde area, which could not, for obvious reasons, be included in the preceding catalogue. As it is desirable, however, that some, at least, of these should be noticed, it is proposed to do so here by way of an appendix. The seaward boundary of what is here called the "Clyde Area" is a line extending from the Mull of Cantyre to Corsewall Point at the mouth of Loch Ryan.

FISHES.

Among the fishes obtained, the following may be mentioned:—

Lumpenus lampretiformis.—A specimen of this species was captured

in the deep water between Arran and the Heads of Ayr, and another midway between the Island of Sanda and Beunnan Head.

Triglops Murrayi, Günther.—A young specimen of this somewhat rare species was taken in the shrimp-trawl, a short distance to the eastward of Sanda.

The ‘Black mouthed dog-fish’ (*Pristiurus melanostomus*) and the ‘Lesser spotted dog-fish’ (*Syllium canicula*) were captured in the ‘Garland’ trawl; the former was taken off Arran, and the latter in the vicinity of Ailsa Craig.

A few specimens of the ‘Flapper skate’ (*Raia macrorhynchus*) were obtained by the ‘Garland’ in different parts of the seaward area of the Clyde; a specimen, captured in the deep water to the east of Arran, measured 40 inches across the pectoral fins.

MOLLUSCA.

Trochus granulatus, Born.—A single living specimen of this mollusc was taken off the Island of Sanda. This locality, though near the mouth of the estuary, is still within the Clyde area; and as this species does not appear to have been hitherto included among the recent mollusca of the Clyde, its occurrence here is of interest. Dr Jeffreys, in *British Conchology*, states that the species has been obtained off the Mull of Galloway in 50 fathoms, and also refers to it having been found in Belfast Bay; but adds that the two broken specimens found there had probably been accidentally introduced. These are the nearest to the Clyde, of the localities from which the species has been recorded.

CRUSTACEA.

Gonoplax angulata (Fabricius).—A male specimen of this crab was captured on the 3rd of November 1896, in the vicinity of Ailsa Craig, and on the following day a female was obtained a few miles south-eastward of the Mull of Cantyre. This species has for many years past been included among the Clyde crustacea; but in recent years there seems to be a tendency to doubt the accuracy of the Clyde records. The capture of these two specimens, even though the localities be near the seaward boundary of the estuary, will therefore help to some extent to remove the uncertainty as to the correctness of these earlier records.

Nika edulis and *Pasaphaea sivado*, etc.—Both of these crustaceans are sometimes of more or less frequent occurrence near the mouth of the Clyde estuary.

Hippolyte prideauxiana, Leach.—A single specimen of this little shrimp (a female with ova) was obtained near the outer boundary of the Clyde in November last; it is an addition to the Clyde fauna. *H. prideauxiana* is sometimes captured off the coast of Devon. I am indebted to the Rev. T. R. R. Stebbing for the name of the species.

Siriella norvegica, G. O. Sars.—One or two specimens were recently identified among some surface tow-net material from the Clyde, collected a few miles to the east of the Island of Pladda. This is also an addition to the Clyde fauna.

Erythrops serrata, G. O. Sars.—During the past year this schizopod has been obtained in several parts of the Clyde area, sometimes alone, sometimes in company with another and smaller species,—*Erythrops elegans*. Neither of these are recorded in Prof. Henderson's *Decapod and Schizopod Crustacea of the Clyde*.

Monoculodes tuberculatus, G. O. Sars.—A single specimen of this amphipod occurred in a tow-net gathering, collected a few miles east of the Island of Arran. There does not appear to be any previous record of it in the British seas.

Epimeria tuberculata, G. O. Sars.—A single specimen was obtained in the vicinity of Ailsa Craig. There appears to be no previous British record of this species. I am indebted to the Rev. T. R. R. Stebbing for the names of both these amphipods.

Ephimelia Eblanae, Spence Bate.—Two small specimens of an amphipod, which Mr Stebbing thinks may probably belong to this species, were obtained in the seaward part of the Clyde estuary. They resemble somewhat closely the figure of the species in Bate and Westwood's *British Sessile-Eyed Crustacea*, but are smaller than the size stated by these authors.

Philomedes (Cypridina) brenda (Baird).—Two specimens, both males, of this rare ostracod were obtained in the Clyde, in the deep water to the east of Arran. Dr Brady, who kindly examined one of the specimens, says: 'Your specimen is, I have no doubt, *P. brenda*.' The only previous British records for this ostracod appear to be the following:—Off the coast of Durham, near the Dogger Bank (Rev. A. M. Norman). Off Noss, in Shetland, 80–90 fathoms (M'Andrew). Ultra-British distribution, Greenland (Holsteinbourg Harbour); various parts of Norway and Sweden, from E. Finmark and Trondhjem to Drobak and Kullaberg.*

Aspidophryxus peltatus, G. O. Sars (Pl. III. fig. 19). Several specimens of this curious crustacean were obtained as parasites on *Erythrops serrata* and *Erythrops elegans* (already recorded), but chiefly on the former. Males appeared to be scarce, and any that were noticed were not adhering to the females, but were each some distance apart, and connected to the female by a slender filament, as shown by the drawing (fig. 19). Rev. Mr Stebbing also identified this species for me.

COPEPODA.

A considerable number of copepods have, in addition to those recorded from Loch Fyne, been discovered in various parts of the Clyde area. It is not my intention, however, to record all these at present; that may probably be done more fully later on. Meantime, I only give detailed descriptions of three species that appear to be new to science.

Stenhelia intermedia, sp. n. (Pl. II. figs. 10–21).

Description of the Female.—Length about .7 mm. ($\frac{1}{28}$ th of an inch). Body robust. Autennules eight-jointed; the first four moderately stout and sub-equal; the fifth, sixth, and seventh small, but of nearly equal length, while the end joint is about as long as the fourth joint; the first four joints are together fully twice the entire length of the last four

* *Mon. of the Marine and Fresh-Water Ostracoda of the N. Atlantic and North-Western Europe*, by Drs Brady and Norman (Second Part), p. 656 (1896).

(fig. 11). Antennæ, with secondary branches elongate and slender, three-jointed; the middle joint very small, the other two sub-equal (fig. 13). Mandibles and other mouth organs somewhat similar to those of *Stenelia hispida*, Brady (figs. 14, 15). The first pair of swimming feet are moderately stout; the inner branches, which are rather longer than the outer, have the first joint equal to nearly twice the entire length of the second and third, which are short and sub-equal; the joints of the outer branches are nearly of equal length, and armed with strong marginal spines; a stout spine springs from both the exterior and interior angles of the second basal joint (fig. 16). The inner branches of the next three pairs are rather shorter than the outer branches; in the fourth pair the outer branches are nearly one and a half times longer than the inner branches (fig. 18). The basal joints of the fifth pair are broadly ovate, and produced interiorly so as to extend to near the extremity of the secondary joints; a short stout seta springs from the distal half of the inner margin of the basal joint, and four setæ from the broad and somewhat truncate apex, the two middle setæ being considerably longer than the others; secondary joints sub-quadrangular, and furnished with five setæ of variable lengths round the distal end (fig. 19). Caudal stylets short, not half the length of the last abdominal segment; the principal seta of each stylet very stout, and somewhat fusiform (fig. 21).

Description of the Male.—The male differs from the female in having the antennules modified to form powerful grasping organs (fig. 12). The inner branches of the second pair of feet are, like those of the males of *Stenelia ima*, two-jointed, and rather shorter than the outer branches, and are each provided with two stout spine-like terminal appendages (fig. 17). The fifth pair, which are smaller than those of the female, have the basal joint armed interiorly with two stout apical spines; the secondary joint is provided with two stout spines on the inner margin,—the posterior spine being longer than the other; two sub-apical spines exteriorly, one short and one of moderate length, and a moderately long apical seta; three setæ also spring from a small foliaceous appendage on the first abdominal segment, and immediately behind the fifth pair of feet (fig. 20).

Habitat.—Kilbrennan Sound; not very common.

Remarks.—This species is somewhat intermediate between *Stenelia hispida* and *Stenelia ima*. It has the stout build of the first, while the structure of the second feet in the male somewhat resembles those of the male of *Stenelia ima*; but one of the characters which, at a glance, distinguishes this from the other species, is the remarkably stout seta on each of the caudal stylets.

Cletodes tenuipes, sp. n. (Pl. I. figs. 19–27).

Description of the Female.—Length about .55 mm. ($\frac{1}{45}$ th of an inch). Somewhat like *Cletodes propinqua* in general appearance (fig. 19). Antennule small, five-jointed; the second and last joints are longer than the others, but the fourth is very small; the last three joints bear moderately stout setiferous spines (fig. 20). The secondary branches and the antennæ are rudimentary; they are each reduced to a single seta (fig. 21). Mandibles well developed; palp small, one-jointed (fig. 22). Posterior foot-jaws moderately stout (fig. 23). All the swimming feet are slender, especially the inner branches,—those of the fourth pair being almost rudimentary. In the first pair the length of the inner branches is equal to about two-thirds the length of the outer branches; the first joint is very short, but the second is elongate (fig. 24). In the next three pairs the inner branches, which, like those of the first pair, are all two-jointed, are much shorter than the outer branches; those of the fourth pair are very slender,

and scarcely half the length of the outer branches ; the first joint is very minute, the second is elongate and setiform, and bears a single terminal hair ; the outer branches are slender and elongate, and the marginal spines are also slender (fig. 25). In the fifth pair the basal joint is small, interiorly subquadangular, but produced exteriorly to form the base of a moderately stout seta ; an elongate plumose seta springs from the inner angle. Secondary joint narrow suborate, the length being equal to fully three times the width at the broadest part ; it is furnished with six setæ,—three on the outer margin, one on the inner margin, and two at the apex (fig. 26). Caudal stylets elongate and narrow, rather longer than the last abdominal segment, and somewhat attenuated towards the distal end. Two small setæ spring from the outer edge of each stylet, and rather nearer the base than the apex. Terminal setæ, two—one small and one elongate (fig. 27).

Habitat.—Near Carradale, Kilbrennan Sound.

Remarks.—The species now described somewhat resembles *Cletodes propinqua*, Brady and Robertson ; but the structure and slender form of the swimming feet readily distinguish it from that form, and also from the next. No males were observed.

Cletodes hirsutipes, sp. n. (Pl. I. figs. 11–18).

Description of the Female.—Length about .6 mm. ($\frac{1}{40}$ th of an inch). Somewhat like *Cletodes propinqua* in general appearance (fig. 10). An antennæ five-jointed, short ; the first three and the last joints sub-equal ; the fourth is very small ; the second, third, and fourth joints bear several strong spines (fig. 11). The antennæ are provided with short one-jointed secondary branches, each with two setæ (fig. 12). Mandibles rather feeble, armed with about four elongate slender teeth (fig. 13). Both branches of the first four pairs of swimming feet short and stout ; the outer branches, three, the inner two, jointed ; the inner branches of the first pair are equal to about three-fourths the length of the outer branches, and the end joint is scarcely twice the length of the first joint ; both the inner and the outer branches are densely fringed with short hairs (fig. 15). The next three pairs have also both branches fringed with short setæ ; in the fourth pair the outer branches are about one and a half times longer than the inner, and the apical setæ are very long and plumose (fig. 16). In the fifth pair the basal joint is produced interiorly, so as to form a narrow and sub-quadangular lamina, the apex of which reaches beyond the middle of the secondary joint ; it is armed with three stout spiniform setæ,—one being at the apex and two near the middle of the inner margin ; the secondary joint is narrow oblong, the length being equal to nearly three times the width ; the outer margin is densely fringed with hairs, and four spiniform setæ spring from the broadly rounded apex (fig. 17). Caudal stylets, about as long as the last abdominal segment, foliaceous, and somewhat distorted ; the inner margin being broadly and obliquely rounded, while there is a slight concavity near the middle of the outer edge (fig. 18).

Habitat.—Kilbrennan Sound, near Carradale ; rather scarce.

Remarks.—The structure of the mandibles and the stout and hirsute thoracic feet are characters sufficiently distinct to distinguish this from other British species ; the fringe of hairs on the margin of the secondary joints of the fifth pair is frequently so coated with mud as to have the appearance of a continuous brownish-coloured border. No males were observed

SOME PARASITES OF *CALANUS FINMARCHICUS*.

FIRST.

Calanus with (?) *Microniscus calani*, G. O. Sars (Pl. III. fig. 20). The drawing shows a *Microniscus* in situ on a *Calanus*, and this is the position in which I usually find the parasite when it happens to be attached to a *Calanus*; but the parasite is more frequently obtained free than in the position shown by the drawing, through its having, in one way or other, become detached from the copepod.

SECOND.

Calanus infested by a *Nematode* parasite (Pl. III. fig. 21). This drawing is that of a *Calanus*, bearing internally a *Nematode* parasite much longer than its host. It sometimes happens that a considerable proportion of the *Calani* contained in a tow-net gathering will be found infested by these parasites, while at other times the parasites are rarely observed.

THIRD.

Calanus with (?) *Infusorian* parasite (Pl. III. fig. 22). This drawing is that of a *Calanus* with an *Infusorian*-like parasite adhering to it. Specimens of *Calanus* are sometimes found with several of these organisms attached to them; the parasites are found adhering to the body of the copepods, to the antennules, to the antennæ, and to other appendages, but usually about the head; sometimes large numbers of *Calanus* will be found infested by these parasites.

All these three parasitic forms have been observed in the Clyde, up as far as the head of Loch Fyne, during the past year.

DESCRIPTION OF THE PLATES.

PLATE I.

Delavalia mimica, n. sp.

Fig.	1.	Female, side view,	.	.	.	x	50	diameters
Fig.	2.	Antennule, female,	.	.	.	x	507	"
Fig.	3.	Mandible and Palp,	.	.	.	x	507	"
Fig.	4.	Posterior foot-jaw,	.	.	.	x	760	"
Fig.	5.	Foot of first pair of swimming feet,	.	.	.	x	380	"
Fig.	6.	Foot of fourth pair of swimming feet,	.	.	.	x	337	"
Fig.	7.	Foot of fifth pair of swimming feet, female,	.	.	.	x	380	"
Fig.	8.	Foot of fifth pair of swimming feet, male, (A) Appendage of first ab- dominal segment, male,	.	.	.	x	380	"
Fig.	9.	Last abdominal segments and caudal stylets,	.	.	.	x	253	"

Cletodes hirsutipes, n. sp.

Fig. 10.	Female, side view,	.	.	.	x	80	diameters.
Fig. 11.	Antennule,	.	.	.	x	380	"
Fig. 12.	Antenna,	.	.	.	x	380	"
Fig. 13.	Mandible and Palp	.	.	.	x	760	"
Fig. 14.	Posterior foot-jaw,	.	.	.	x	760	"
Fig. 15.	Foot of first pair of swimming feet,	.	.	.	x	380	"
Fig. 16.	Foot of fourth pair of swimming feet,	.	.	.	x	507	"
Fig. 17.	Foot of fifth pair, female,	.	.	.	x	380	"
Fig. 18.	Last abdominal segments and caudal stylets,	.	.	.	x	190	"

Cletodes tenuipes, n. sp.

Fig. 19.	Female, side view,	.	.	.	x	160	"
Fig. 20.	Antennule,	.	.	.	x	760	"
Fig. 21.	Antenna,	.	.	.	x	760	"
Fig. 22.	Mandible and Palp,	.	.	.	x	760	"
Fig. 23.	Posterior foot-jaw,	.	.	.	x	760	"
Fig. 24.	Foot of first pair of swimming feet,	.	.	.	x	760	"
Fig. 25.	Foot of fourth pair of swimming feet,	.	.	.	x	760	"
Fig. 26.	Foot of fifth pair of swimming feet,	.	.	.	x	760	"
Fig. 27.	Last abdominal segments and caudal stylets,	.	.	.	x	507	"

PLATE II.

Bradyponius Normani (B. and R.).

Fig. 1.	Foot of first pair of swimming feet,	.	x	190	"
Fig. 2.	Foot of fourth pair of swimming feet,	.	x	126	"

Paramisophria cluthæ, n. g. and n. sp. (female).

Fig. 3.	One of the antenna,	.	.	x	126	"
Fig. 4.	Anterior foot-jaw,	.	.	x	190	"
Fig. 5.	Posterior foot-jaw,	.	.	x	190	"
Fig. 6.	Foot of first pair of swimming feet,	.	x	190	"	
Fig. 7.	Foot of fourth pair of swimming feet,	.	x	126	"	
Fig. 8.	Foot of fifth pair of swimming feet,	.	x	190	"	

Stephos gyrans (Giesbrecht).

Fig. 9.	Antennule,	.	.	x	126	"
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Stenelia intermedia, n. sp.

Fig. 10.	Female, lateral view,	.	.	x	80	"
Fig. 11.	Antennule, female,	.	.	x	380	"
Fig. 12.	Antennule, male,	.	.	x	380	"
Fig. 13.	Antenna,	.	.	x	380	"
Fig. 14.	Mandible and Palp,	.	.	x	380	"
Fig. 15.	Posterior foot-jaw,	.	.	x	380	"
Fig. 16.	Foot of first pair of swimming feet,	.	.	x	380	"
Fig. 17.	Foot of second pair of swimming feet, male,	.	.	x	337	"

Fig. 18.	Foot of fourth pair of swimming feet,		×	253	diameters.
Fig. 19.	Foot of fifth pair of swimming feet, female,	.	×	380	"
Fig. 20.	Foot of fifth pair of swimming feet, male	.	×	380	"
Fig. 21.	Last abdominal segments and caudal stylets,	.	×	253	"

PLATE III.

Bradyponlius Normani (B. and R.).

Fig. 1.	Female, dorsal view,	.	.	×	40	"
Fig. 2.	Male, dorsal view,	.	.	×	52	"
Fig. 3.	Antennule, female,	.	.	×	168	"
Fig. 4.	Antennule, male,	.	.	×	126	"
Fig. 5.	Antenna,	.	.	×	253	"
Fig. 6.	Mandible,	.	.	×	190	"
Fig. 7.	Maxilla,	.	.	×	190	"
Fig. 8.	Anterior foot-jaw,	.	.	×	190	"
Fig. 9.	Posterior foot-jaw,	.	.	×	190	"
Fig. 10.	Foot of fifth pair, female,	.	.	×	380	"
Fig. 11.	Appendage of the first abdominal segment (male),	.	.	×	380	"

Hersiliodes littoralis (T. Scott).

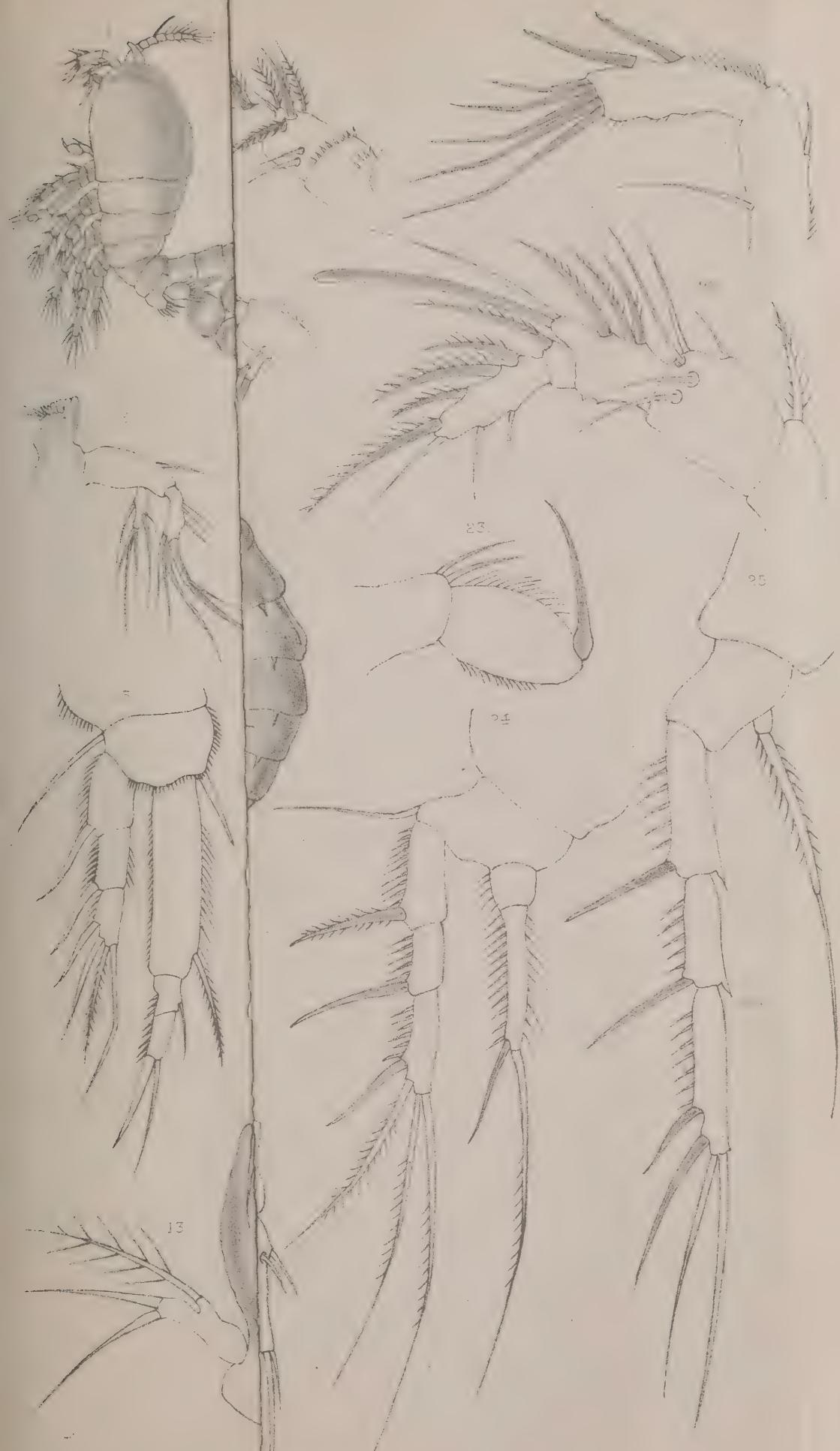
Fig. 12.	Female, dorsal view,	.	.	×	67	
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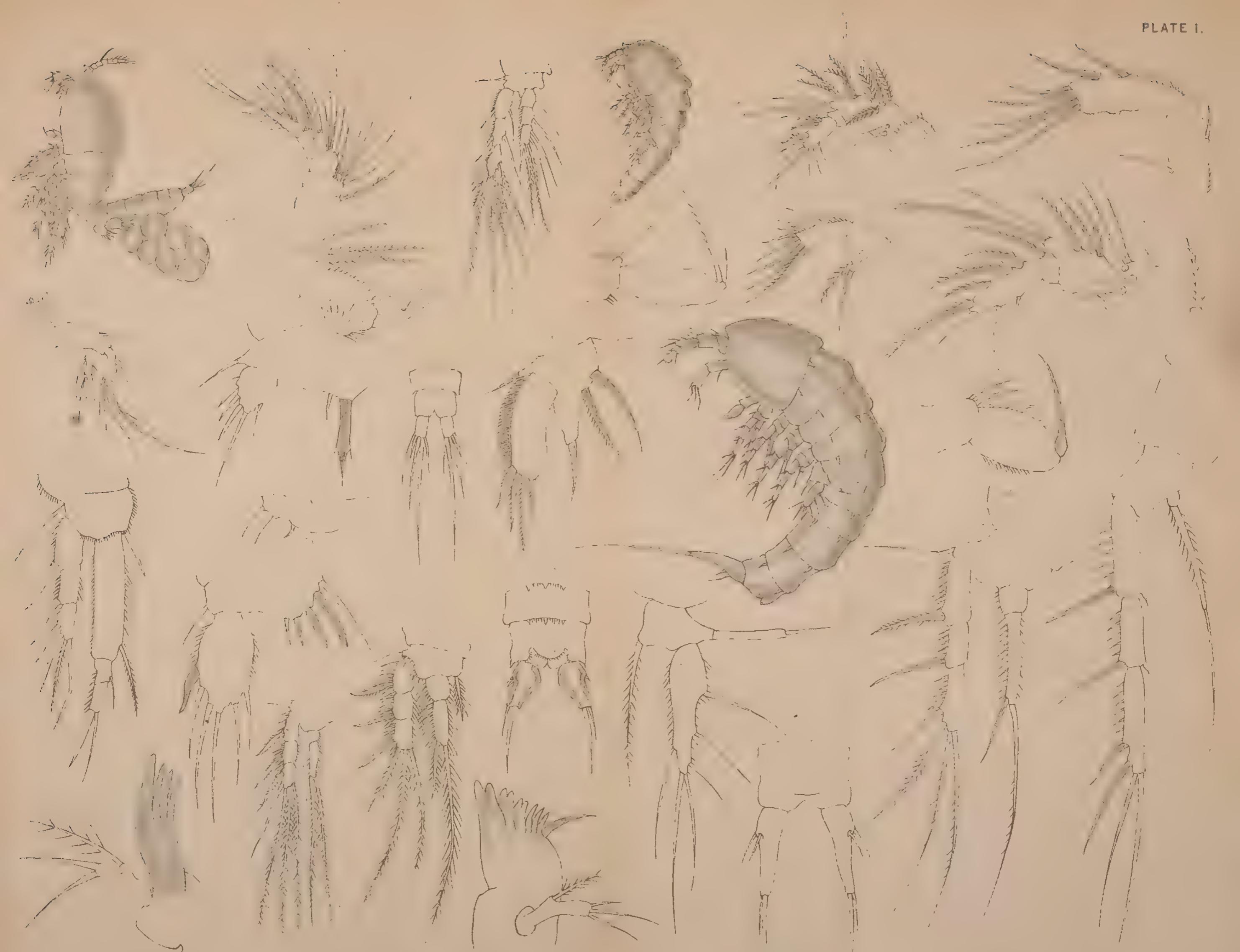
Paramisophria cluthæ, n. g. and n. sp.

Fig. 13.	Female, side view,	.	.	×	70	"
Fig. 14.	Antennule,	.	.	×	127	"
Fig. 15.	Maxilla,	.	.	×	135	"
Fig. 16.	Last abdominal segments and caudal stylets,	.	.	×	104	"

Stephos gyrans (Giesbrecht).

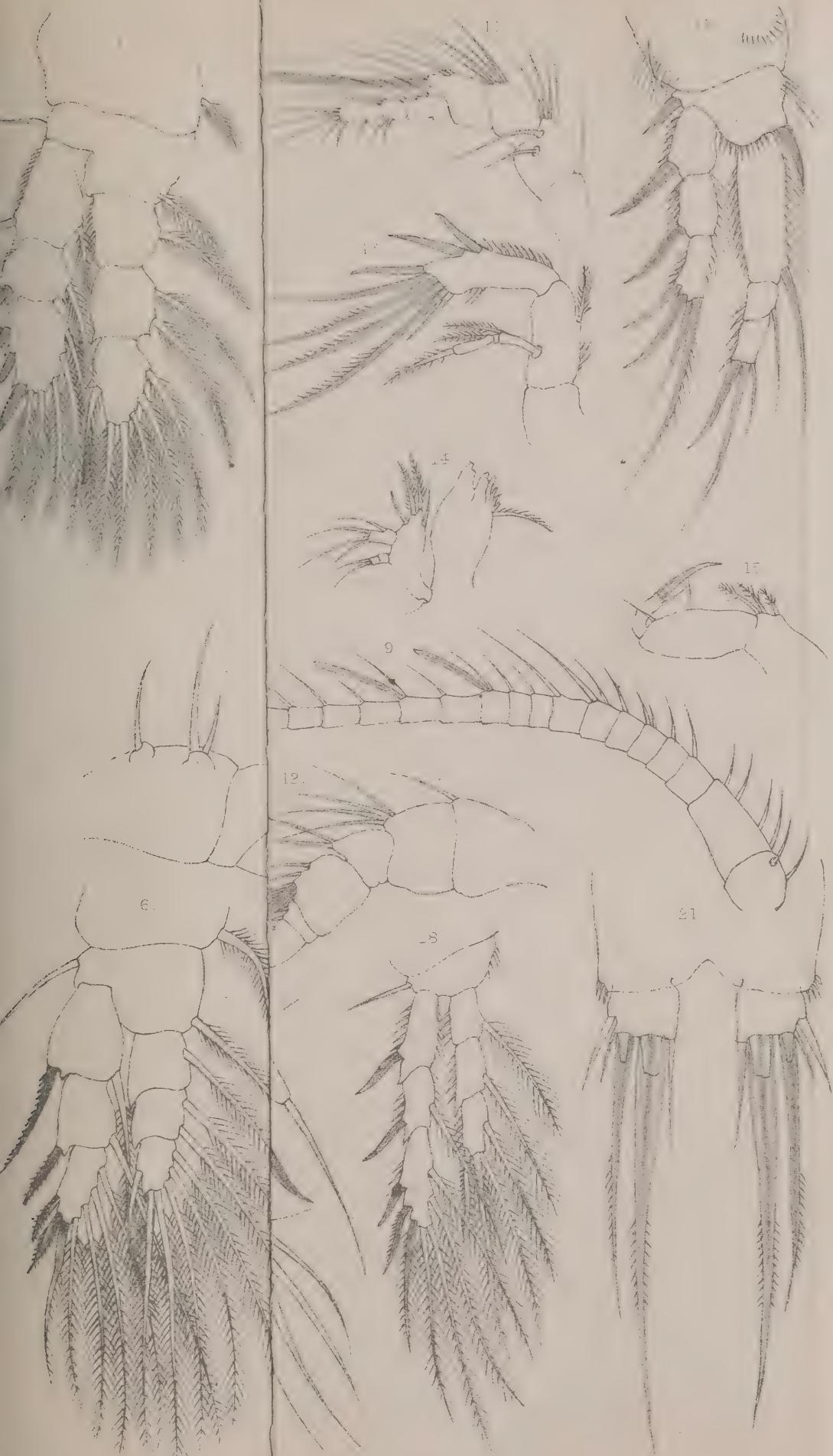
Fig. 17.	Female, side view,	.	.	×	52	"
Fig. 18.	Foot of fifth pair,	.	.	×	380	"
Fig. 19.	<i>Aspidophryxus peltatus</i> , G. O. Sars, male and female,	.	.	×	70	"
Fig. 20.	<i>Calanus</i> , with <i>Microniscus calani</i> at- tached,	.	.	×	35	"
Fig. 21.	<i>Calanus</i> , with parasitic nematode,	.	.	×	35	"
Fig. 22.	<i>Calanus</i> , with (?) Infusorian parasite,	.	.	×	35	"

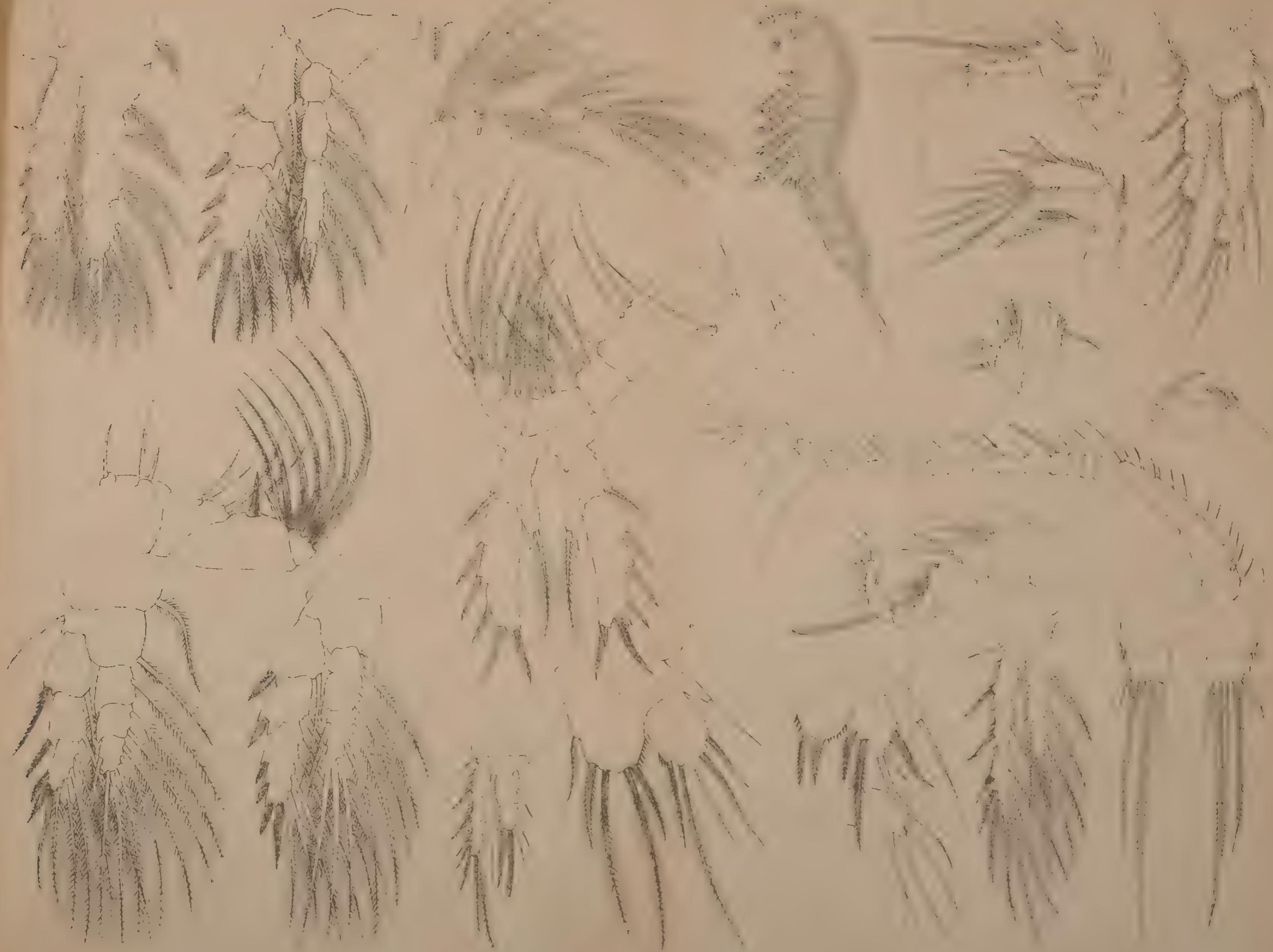




A. Scott del. ad nat.

FIGS. 1-9.—*Delavalia mimica*, sp.n.FIGS. 10-18.—*Cletodus hirsutipes*, sp.n.FIGS. 19-27.—*Cletodes tenuipes*, sp.n.

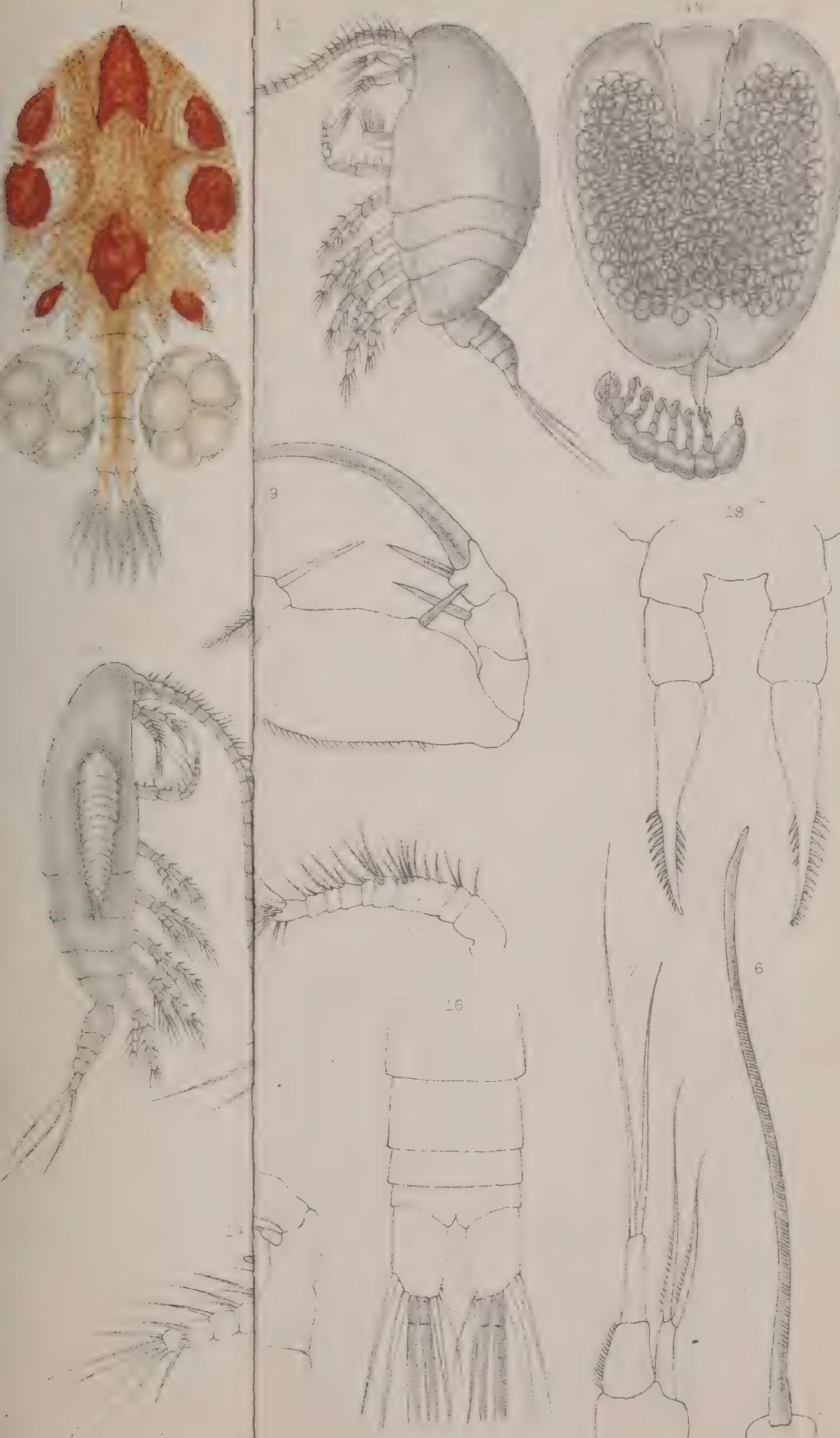




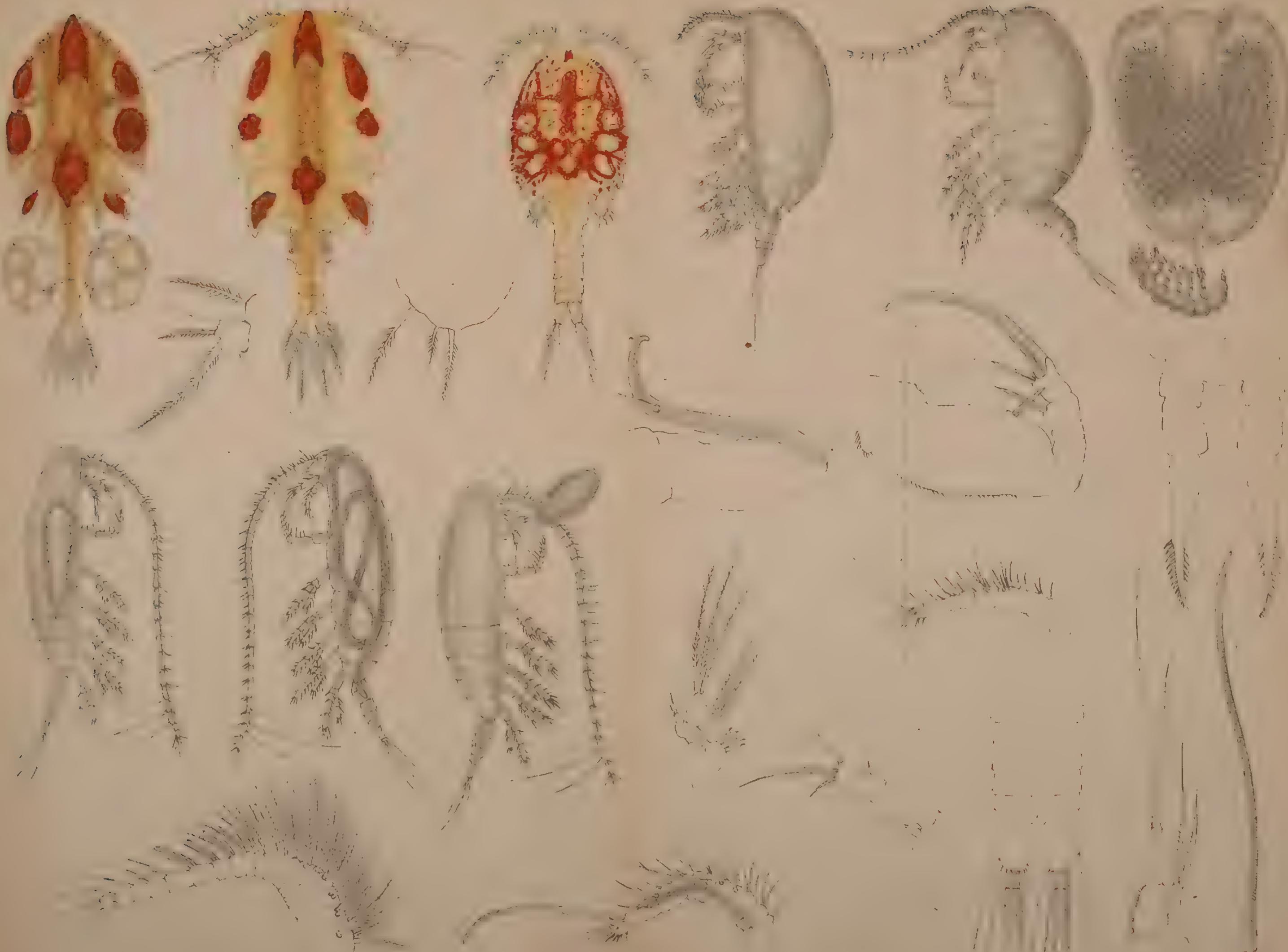
A. Scott del.ad nat.

FIGS. 1 and 2.—*Bradyponitus* Normant (B. & R.).FIGS. 3-8.—*Paramisophria clathr.* Giese sp.n.FIG. 9.—*Stephos gyrans* (Giesb.).FIGS. 10-21.—*Stenella intermedia*, sp.n.

PLATE III.



A. SCOTT del. et pinx. ad nat.
Phria cluthæ, g. et. sp.n.
marchicus with parasites



A. S. Ortmann, ad nat.

FIGS. 1-11.—*Liodiploctinus Normani* (B. & R.).
FIGS. 17 and 18.—*Siphonoglyans* (Giesb.).FIG. 12.—*Hesidodes littoralis* (T. Scott).
FIG. 19.—*Apatophryas pallatina* G. O. Sars. (♂ and ♀).FIGS. 13-16.—*Faunidopoda clathrata*, sp. n.
FIGS. 20-22.—*Ceratoconcha* (n. gen.) as with present





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